# STEEL

**PRODUCTION • PROCESSING • DISTRIBUTION • USE**

*For forty-eight years—IRON TRADE REVIEW*

**EDITORIAL STAFF**

E. L. SHANER, *Editor*
E. C. BARRINGER, *Managing Editor*
E. C. KREUTZBERG, *Engineering Editor*

**ASSOCIATE EDITORS**

A. J. HAIN — E. F. ROSS
G. H. MANLOVE — J. D. KNOX
A. H. ALLEN

*New York* — B. K. PRICE—L. E. BROWNE
*Pittsburgh* . . . — E. A. FRANCE JR.
*Chicago* . . . . . — W. G. GUDE
*Washington* . . . . . — L. M. LAMM
*London* . . . . — VINCENT DELPORT

**Published by**
**PENTON PUBLISHING CO.**
PENTON BUILDING
CLEVELAND, O.

JOHN A. PENTON, *Chairman of Board*
C. J. STARK . . . . . *President*
J. D. PEASE . . . *Vice President*
F. V. COLE . . . . . *Secretary*

**BUSINESS STAFF**

GEORGE O. HAYS, *Business Manager*

*New York*
J. F. AHRENS — E. W. KREUTZBERG
*Pittsburgh* . . . . — S. H. JASPER
*Chicago* . . . . . — L. C. PELOTT

*Cleveland*
JOHN HENRY — R. C. JAENKE

R. T. MASON, *Circulation Manager*


# Contents . . November 5, 1934


**Volume 95 ◆ Number 19**



AS THE EDITOR VIEWS THE NEWS ..... 13

NEWS OF THE WEEK:

Steelmakers' Third Quarter Loss $22,930,000 ..... 14

Labor ..... 16
Durable Goods ..... 16
Iron Ore ..... 16
New Capacity ..... 16
Tariff ..... 16
PWA ..... 17
Housing ..... 17
NRA ..... 17
Production ..... 17

Ballots Show Feeling Against New Deal Is Mounting .. 17
October Pig Iron Output Makes Small Gain ..... 18
Windows of Washington ..... 19
Mirrors of Motordom ..... 21
Here and There in Industry ..... 22
Industrial Men in the Day's News ..... 23
Obituaries ..... 24
September Exports Make Record ..... 25

EDITORIAL—Union Labor Arrogance Is Obstacle .... 26
THE BUSINESS TREND ..... 27

ENGINEERING DEVELOPMENTS:

Gas Cutting Machines .... 29
Directional Properties .... 32
Grain Size Symposium .. 34
Methods and Materials .. 40
Nickel Plating Baths ..... 40
Air Circulator ..... 42
Precautions in Welding.. 59
Leakproof Pipe Joints .... 60
Steel in Steering Gears .. 62
Gas Association Meeting.. 63
Steelmaking Progress .... 65
Foundry Convention ..... 66
New Equipment ..... 68
Trade Publications ..... 70

Preview of Acetylene Association's Convention ..... 43-58
MARKET REPORTS AND PRICES ..... 71-92
CONSTRUCTION AND ENTERPRISE ..... 95
ADVERTISING INDEX ..... 110



NRA MEMBER U.S. WE DO OUR PART



**BRANCH OFFICES:**

**New York** . . . . . **220 Broadway**
**Chicago** . . . . **Peoples Gas Building**
**Pittsburgh** . . . . . **Oliver Building**
**San Francisco** . . . . **441 Merrit Ave., Oakland, Calif., Tel. Holiday 4290**
**Washington** . . . **National Press Building**
**Cincinnati** . . . **418-420 Sinton Hotel**
**London** . . . . . **Caxton House Westminster, S. W. 1**
**Berlin** . . **Berlin, N. W. 40, Roonstrasse 10**

Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada one year $6.60, two years $11.20; in Great Britain and European countries, one year £2.

Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.


Copyright 1934 by Penton Publishing Co.

*"Photo, actual size"*

# "A. W." SUPER-DIAMOND

- SUPER *SAFETY*
- SUPER *EFFICIENCY*
- SUPER *QUALITY*
- SUPER *APPEARANCE*

HERE'S a brand new tread design in "A.W." Rolled Steel Floor Plate. Projections are of the standard "A.W." oval diamond type Rolled Steel Floor Plate pattern, placed at right angles to each other. "Super-Diamond" is a safer flooring with better non-skid qualities—but otherwise the same rugged, adaptable, sanitary ***Rolled Steel Floor Plate*** that wears for years, under the hardest of traffic conditions.

"A.W." Rolled Steel Floor Plate is the modern solution to the old, old problem of flooring maintenance.

Let us tell you more about "Super-Diamond" and other types of "A.W." Rolled Steel Floor Plate for all severe service conditions.

**ALAN WOOD STEEL CO.**
**CONSHOHOCKEN, PA.**

*108 Years' Iron and Steel Making Experience*

ALAN WOOD STEEL CO. ESTABLISHED TRADE "A.W." MARK 1826 CONSHOHOCKEN, PA.

BRANCHES: Philadelphia, Pa., Fidelity Philadelphia Trust Bldg.; New York, N. Y., 60 E. 42nd St.; Boston, 250 Stuart St.; Los Angeles, 620 W. McGarland Bldg.; San Francisco, 444 Market St.; Seattle, 4535 5th Ave., N.E.

REPRESENTATIVES: Buffalo, F. E. Allen, Inc.; Pittsburgh, C. C. Poling Co.; Detroit, G. C. Davies Co.; Cleveland, J. F. Corlett & Co.; Chicago, A. M. Castle & Co.; New Orleans, Jones & Laughlin Steel Corp.; Birmingham, J. H. Scruggs Co.; Minneapolis, R. E. Deutsche Co.; Memphis, S. A. Hunt, P. O. Box 1646.

# As the Editor Views the News

NOV. 6 may bring forth reassuring developments which will stimulate activity in industry. Not the least important of these is the expected defeat of Upton Sinclair. If the vote goes as the straw polls indicate, American business will utter a sigh of relief and at the same time may well accord a vote of thanks to Mr. Sinclair for his service in acting unwittingly as the catspaw for the Roosevelt administration. The President, Mr. Farley, Mr. Hopkins and others thought well enough of the Sinclair ideas to flirt with him when he won the nomination. When business and public sentiment turned against the novelist, the new dealers dropped him abruptly.

• • •

**What Nov. 6 Vote Means**

Had fortune favored the Californian's campaign, had public sympathy rallied to his support, or had the leaders of business and finance been less active in their efforts to save themselves and their state from the dangers of the Epic plan, it is unlikely that President Roosevelt would have courted the favor of conservatives as assiduously as he has during the past few weeks. A sound defeat for Sinclair and a significant strengthening of the forces of stable government in other sections will go a long way toward helping the Chief Executive to steer a safe course to the right in the approaching critical months.

• • •

**A Slap for A. F. L.?**

Hope that the administration henceforth will pursue policies upon which the President and industry can work more harmoniously is brighter today than at any time in six months. The President has just issued an executive order extending the automobile manufacturers' code to Feb. 1 without change. This action, coupled with the recently announced plans for a greater volume of output in 1935 (p. 21) and for the expansion of facilities in various sections (p. 22) will go far in restoring confidence in the President's new gestures toward industry. His failure to grant union labor's demand for changes in the auto code (although he provided for studies of stabilization of employment) may be construed as a favorable sign. Professional unions are due for a curb against their abuses (p. 26), and the current Rooseveltian act may be a hint that he is becoming impatient with their arrogance.

• • •

**Help for Durable Goods**

Encouragement, which even the disappointing reports of third-quarter earnings (p. 14) cannot dim, is afforded by the tendency of the government to consider for future PWA and CWA projects work in which materials and equipment are involved to a greater extent than heretofore. Under this policy (p. 20) the objective of reemployment will be directed more upon the plants in the durable goods industries than upon common labor in the field. Here again one finds belated government acquiescence to a policy which industry has been advocating strenuously for many months. The use of PWA money for grade crossing elimination is being urged more strongly in many quarters. A new argument for it is provided by the safety requirements of high speed, streamlined trains.

• • •

**A Record in Exports**

Iron and steel exports in September touched the extraordinary total of 301,330 gross tons. This is the highest monthly figure reported since the iron and steel division of the department of commerce was established in 1921. Heavy shipments of scrap (p. 25) contributed to the record . . . . Award by Carnegie Steel of a 42-inch continuous strip mill (p. 16) brings the number of continuous mills now under construction to three . . . . International Acetylene association, founded in 1898, announces an interesting program (p. 46) for its approaching convention in Pittsburgh, and STEEL, appropriately, presents a number of articles on flame cutting (pp. 29, 45) and on recent progress in the application of the oxyacetylene process (pp. 47, 52).

E. L. Shaner

# Steelmakers' Third Quarter Loss $22,919,000=$5.61 Ton

FIRST fourteen steel producers to issue their financial statements for the third quarter, representing 83 per cent of the ingot-making capacity of the country, report an aggregate deficit of $19,023,200.

This indicates that the net deficit for the entire industry in the third quarter was approximately $22,919,000, which on the basis of an output of 4,087,573 tons suggests that on each ton of raw steel made in the third quarter producers lost $5.61.

Only two of these 14 producers reported a profit for the third quarter, but all 14 made a net of $18,784,205 in the second quarter. Relating this profit to the entire industry, the indicated profit was $22,630,000 and with production 10,266,196 tons, the average profit per ton in the second quarter was $2.21.

**From Black to Red**

Thus, increased wages, combined with a drastic reduction in production turned a profit of $2.21 per ton in the second quarter to a deficit of $5.61 per ton in the third quarter.

The same 14 producers experienced in the first three quarters of 1934 a net deficit of $7,858,850. Eight producers were in the black for this nine-month period and six in the red.

In the corresponding period of 1933 these producers ran up a deficit of approximately $50,500,000, and in the first nine months of 1932 their aggregate losses were $99,500,000.

# Wages Send Steel Corp. Deficit Up

INCREASED operating costs, due largely to higher wages, combined with a sharp contraction in production, piled up a deficit of $9,826,767 for the United States Steel Corp. in the third quarter. This compares with a net of $5,350,241 in the second quarter and a deficit of $2,717,014 in the third quarter of 1933.

However, comparing nine months of 1934 with nine months of 1933, improvement is shown, the deficit this year being only $11,466,000, against $28,075,000 last year. This showing for the three-quarter period is the better, considering that the Corporation was employing 194,000 persons this year against 166,000 last year, and that payrolls for 1934 to date total $163,925,000, contrasted with $114,287,000 a year ago.

Whereas the Corporation was operating at 52½ per cent in June, its average for the third quarter declined to 24 per cent. In early October operations fell to 20 per cent, but are now at 22, and there are indications, Myron C. Taylor, chairman of the Corporation, said, "of gradual continued improvement".

The usual 50-cent dividend on steel preferred stock was declared.

Details of the steel corporation's third quarter showing follow:

| | | |
|---|---|---|
| Earnings and income for the quarter after deducting all expenses, including ordinary repairs and maintenance, including also estimated federal, state and local taxes (exclusive of charge for proportion of overhead expenses and taxes shown below) and reserves for contingencies, and including $278,849 profits from sale of capital assets | | $ 3,768,863 |
| Charges and allowances for depletion, depreciation and obsolescence | | 10,224,776 |
| Deficit | | $ 6,455,913 |
| Interest charges for the quarter: | | |
| On bonds of subsidiary companies | $1,252,895 | |
| On United States Steel Corp. bonds outstanding | 3,363 | |
| | | 1,256,258 |
| Total Deficit from operations | | $ 7,712,171 |
| Add, proportion of overhead expenses (of which taxes alone are $1,751,924) of the Lake Superior iron ore properties and Great Lakes transportation service, normally included in the value of the season's production of ore carried in inventories, but which because of curtailment in tonnage of ore to be mined and shipped in 1934 is not so applied | | 2,114,596 |
| | | $ 9,826,767 |
| Dividend for the quarter on stock of United States Steel Corp.: | | |
| Preferred, ½% | | 1,801,405 |
| Total deficit for the quarter provided from Undivided Surplus | | $11,628,172 |

**SHEET & TUBE LOSES MORE**

Youngstown Sheet & Tube Co., Youngstown, O., showed a loss for the third quarter, after all charges including depreciation and depletion, of $1,257,371, compared with profit of $1,012,207 for the second quarter of this year, and a loss of $1,177,576 in the third quarter of 1933.

Total loss for the first nine months of this year was $1,668,633, as compared to loss for the first nine months of 1933 of $6,858,540. At the close of business Sept. 30, the company had cash and investments in government and marketable securities in the amount of $13,042,340, and the ratio of current assets to current liabilities was 11.10 to 1.

**NATIONAL'S PROFIT SHRINKS**

National Steel Corp., Pittsburgh, reports net earnings of $347,199 for the third quarter, comparing with $2,593,629 in the second quarter, and $766,565 in the third quarter last year. Third quarter earning per share was 16 cents, against 35 cents a year ago. However, nine months of 1934 finds net profit $4,582,896, against $2,569,876 earned in the first three quarters of 1933.

In the third quarter of 1934, operating profit was $1,829,434. Charges of $959,498 for depreciation, $492,066 for interest and $30,671 for federal income tax left a net of $347,199.

**INLAND BARELY IN THE RED**

Interest on bonds and depreciation and depletion charges pulled Inland Steel Co., Chicago, slightly into the red in the third quarter when its deficit was $53,476, compared with a profit of $2,129,197 in the second quarter and a net of $623,612 in the third quarter of 1933. For the first nine months of 1934, Inland's net of $3,180,258 compared with loss of $362,680 in the corresponding three quarters of 1933.

**WHEELING LOSS $930,788**

Wheeling Steel Corp., Wheeling, W. Va., reports net loss of $930,788 for the third quarter against net profit of $1,134,511 in the preceding quarter and profit of $263,335 in the third quarter in 1933.

Nine months of 1934 finds net profit of $145,390 against net loss over the same time in 1933 amounting to $56,940.

Otis Steel Co., Cleveland, reports loss of $445,402 in the third quarter, compared to loss of $182,205 in the third quarter of 1933. For nine months, the company showed a net of $570,290, contrasted with $1,139,829 loss in nine months of 1933.

**REGISTERS NEW PREFERRED**

Republic Steel Corp. has filed with the securities and exchange commission (SEC) a registration statement for certificates of deposit of 6 per cent cumulative convertible preferred stock, to be used in connection with the acquisition of the Corrigan, McKinney Steel Corp., Cleveland, and Truscon Steel Co., Youngstown, O. The registration statement shows that Field, Glore & Co., Chicago, and Kuhn, Loeb & Co., New York, are to receive 50,000 shares of Republic

common as compensation for services in connection with the contemplated transactions other than the offer to Truscon.

¶Allegheny Steel Co., Brackenridge, Pa., encountered a loss of $34,133 in the third quarter, compared with profit of $365,830 in the preceding quarter and profit of $152,293 in the third quarter of 1933. For the first nine months of 1934, the company showed a profit of $625,701, against profit of $303,274 in the first nine months of 1933.

### OTHER FINANCIAL REPORTS

Granite City Steel Co., Granite City, Ill.: Third quarter, loss of $46,314; second quarter, profit of $218,686; third quarter 1933, profit of $202,857; first nine months 1934, profit of $153,931; nine months 1933, profit of $233,611.

¶Ludlum Steel Co., Watervliet, N. Y.: Third quater, profit of $7571; second quarter, profit of $264,631; third quarter 1933, profit of $78,828; nine months 1934, profit of $382,946; nine months 1933, profit of $79,070.

¶M. A. Hanna Co., Cleveland: Third quarter, profit of $425,000; second quarter, profit of $325,780; third quarter 1933, profit of $477,424; nine months 1934, profit of $1,131,050; nine months 1933, profit of $872,334.

¶Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.: Third quarter, loss of $49,659; second quarter, loss of $9569; third quarter 1933, profit of $61,350; nine months 1934, profit of $22,615; nine months 1933, profit of $79,939.

¶Wickwire Spencer Steel Co., New York: Third quarter, loss of $229,886; second quarter, profit of $15,479; third quarter 1933, loss of $24,852.

¶Link-Belt Co., Chicago: Third quarter, profit of $194,667; second quarter, profit of $260,662; third quarter 1933, profit of $254,875; nine months 1934, profit of $573,406; nine months 1933, profit of $52,130.

¶National Acme Co., Cleveland: Third quarter 1934, loss of $1709; second quarter, profit of $92,455; third quarter 1933, loss of $46,601; nine months 1934, profit of $148,890; nine months 1933, loss of $309,625.

¶Yale & Towne Mfg. Co., Stamford, Conn.: Third quarter, loss of $70,521; second quarter, profit of $41,011; third quarter 1933, profit of $27,626; nine months 1934, loss of $8256; nine months 1933, loss of $161,791.

¶Mesta Machine Co., Pittsburgh: First half 1934, profit of $463,085.

¶Midvale Co., Philadelphia, has declared a dividend of $1, payable Nov. 7 to record of Oct. 31, the first dividend declared since payment of 50 cents on Jan. 1, 1933.

¶Clark Equipment Co., Buchanan, Mich.: Third quarter, loss of $15,935; third quarter 1933, profit of $52,937; first nine months 1934, profit of $200,597; first nine months 1933, loss of $95,614.

¶Eastern Rolling Mill Co., Baltimore: Third quarter, loss of $187,651; second quarter, loss of $21,099; third quarter 1933, loss of $68,167; nine months 1934, loss of $213,465; nine months 1933, loss of $197,666.

¶Interlake Iron Corp., Chicago: Third quarter, loss of $344,720; second quarter, loss of $221,585; third quarter 1933, loss of $215,228; nine months 1934, loss of $635,261; nine months 1933, loss of $709,638.

¶Budd Wheel Co., Philadelphia: Third quarter 1934, loss of $32,480; second quarter, profit of $89,431; third quarter 1933, profit of $24,307; first nine months 1934, profit of $116,129; first nine months 1933, loss of $262,775.

¶Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.: Third quarter, loss of $332,062; second quarter, profit of $1,744,427; third quarter 1933, loss of $1,513,645.

¶Harbison-Walker Refractories Co., Pittsburgh: Third quarter, net of $207,500; third quarter 1933, net of $500,600; first nine months, net of $977,000; first nine months 1933, profit of $542,100.

¶Edward G. Budd Mfg. Co., Philadelphia: Third quarter, loss of $152,048; second quarter, profit of $80,223; third quarter 1933, profit of $50,297; nine months 1934, loss of $87,282; nine months 1933, loss of $253,252.

¶Superior Steel Corp., Pittsburgh: Third quarter, loss of $157,177; second quarter, loss of $5676; third quarter 1933, profit of $23,387; nine months 1934, loss of $169,119; nine months 1933, loss of $223,721.

¶Midland Steel Products Co., Cleveland: Third quarter, profit of $80,744; second quarter, profit of $22,794; third quarter 1933, profit of $341,632; nine months 1934, profit of $374,395; nine months 1933, profit of $664,991.

### FILE BANKRUPTCY PETITION

Preferred and common stockholders of Williamsport Wire Rope Co., Williamsport, Pa., who are opposing the Bethlehem Steel Corp. on a plan of reorganization have caused the company to file a petition under section 77-b of the bankruptcy act in the United States district court for the middle district of Pennsylvania at Scranton, Pa. Hearing has been set for Nov. 5 at Williamsport, District Judge Albert W. Johnson presiding.

## Deficit of Steel Industry in Third Quarter Offsets Profit of Second

**Black Face Figures Denote Profit;** Light Face Figures Indicate Deficit

| | Third Quarter 1934 | Second Quarter 1934 | Third Quarter 1933 | Nine Months 1934 | Nine Months 1933 | Nine Months 1932 | Annual Steel Ingot Cap. Gross Tons |
|---|---|---|---|---|---|---|---|
| United States Steel Corp. | $9,826,767 | **$5,350,241** | $2,717,014 | $11,466,000 | $28,074,652 | $54,542,431 | 27,341,900 |
| Bethlehem Steel Corp. | 2,400,126 | **3,441,642** | 283,097 | **139,473** | 9,365,395 | 13,782,753 | 9,360,000 |
| Republic Steel Corp. | 2,122,106† | **864,125** | **148,239** | 1,316,663‡‡ | 2,712,647 | 8,640,472 | 5,013,000 |
| Jones & Laughlin Steel Corp. | 1,826,227 | **886,252** | 1,143,917 | 2,864,499 | 4,887,363 | 6,192,859 | 3,660,000 |
| Youngstown Sheet & Tube Co. | 1,257,371 | **1,012,207** | 1,177,576 | 1,668,633 | 6,858,540 | 9,588,038 | 3,120,000 |
| National Steel Corp. | **347,199** | **2,593,629** | **756,565** | **4,582,896** | **2,569,876** | **1,662,919** | 2,232,000 |
| Inland Steel Co. | 53,476 | **2,129,197** | **623,612** | **3,108,258** | 362,680 | 2,209,111 | 2,000,000 |
| Wheeling Steel Corp. | 930,788 | **1,134,511** | **263,335** | **145,390** | 56,940 | 2,284,813 | 1,500,000 |
| Otis Steel Co. | 445,402 | **524,725** | 182,205 | **570,290** | 1,139,829 | 2,176,196 | 830,000 |
| Allegheny Steel Co. | 34,133 | **365,880** | **152,293** | **625,701** | **303,274** | 826,066 | 482,000 |
| Gulf States Steel Co. | 205,374 | **201,616** | **166,670** | 13,571 | **54,543** | 472,078 | 400,500 |
| Granite City Steel Co. | 46,314 | **218,686** | **202,857** | **153,931** | **233,611** | **9,072** | 360,000 |
| Wickwire Spencer Steel Co. | 229,886 | **15,479** | 24,852 | 297,859 | ..... | ..... | 150,000 |
| Ludlum Steel Co.* | **7,571** | **264,631** | **166,301** | **442,436** | **78,829** | 242,028 | 38,000 |
| Totals | 19,023,200 | **18,784,205** | 3,048,786 | 7,858,850 | 50,217,913 | 99,284,854 | 56,486,500 |

*Before federal taxes. †July and August. ‡‡Eight months.

# New Capacity

CARNEGIE STEEL CO., a subsidiary of the United States Steel Corp., Friday formally awarded to the United Engineering & Foundry Co., Pittsburgh, the contract for a 42-inch hot strip mill to be erected at the Carnegie works at McDonald, O., near Youngstown.

This mill, which will roll hot strip up to 38 inches wide, will cost between $5,000,000 and $6,000,000, have a potential capacity of 30,000 to 35,000 tons per month, and will be delivered in seven to eight months.

The mill will be built at the Youngstown works of the United company, which is designing as well as constructing the mill.

This is the second wide continuous strip mill the Steel corporation will operate, the first being a 28-inch mill at the South Works of the Illinois Steel Co., which was completed in 1930.

United is now building a four-high 56-inch strip-sheet mill for the Ford Motor Co. at Dearborn, Mich. Mesta Machine Co., Pittsburgh, is building a similar mill for the Youngstown Sheet & Tube Co., at its Campbell works near Youngstown, the latter installation to include cold as well as hot rolling equipment.

These three mills—for Carnegie, Youngstown Sheet & Tube, and Ford—will have a potential annual capacity of 1,300,000 to 1,400,000 tons of hot strip. Altogether, they represent an investment of approximately $20,000,000, being the largest volume of new capacity under way at any time since 1929.

# Iron Ore

LAKE SUPERIOR iron ore producers, sued recently by Minnesota for the collection of $4,000,000 in delinquent taxes due for the calendar year 1932, won an average 18 per cent reduction by decision of five district judges sitting as a court in Duluth, Nov. 2.

The Oliver Iron Mining Co., subsidiary of the United States Steel Corp., was the principal defendant, joined by 20 other mining companies.

Most of the mining companies' contentions were conceded by the court, in its finding of fact. While the percentage reductions were not as much as the defendants sought, the recognition of their claims that mining properties have been assessed out of proportion with other property in the state is considered as an effective beginning in the fight for lower taxes.

The same companies which defaulted in their 1932 taxes, also defaulted on the same properties for 1933, and the decision also applies to reduce the assessments for that year. Those companies which paid their taxes, of course, will not share in the reduction for those two years, but a general re-assessment for 1934 is indicated.

# Labor

INCREASED agitation by the Amalgamated Association of Iron and Steel Tin Workers, following the decision of the American Federation of Labor at its October convention in San Francisco that it would organize vertical unions and organize the steel industry itself is evident by an influx of complaints originated by the Amalgamated.

Last week petitions were filed with the national steel labor relations board by employes of the Illinois Steel Co. at its Gary, Ind., works, Pittsburgh Steel Co. at its Monessen and Glassport, Pa., works, and Allegheny Steel Co. at its Brackenridge, Pa., plant. In all cases, elections for determination of employe representatives for collective bargaining were sought.

The Illinois Steel Co. case will be heard Nov. 15 at Chicago, and Pittsburgh Steel and Allegheny cases in Pittsburgh, Nov. 8. Cases involving the Youngstown Sheet & Tube Co. and the Acme Steel Co. will be resumed in Chicago, Nov. 12-14. The case involving the Jones & Laughlin Steel Corp. at Aliquippa, Pa., has been set for Pittsburgh Nov. 9-10.

¶William Green, president, American Federation of Labor, is proposing a nation-wide, balanced increase of 30 per cent in production as a means of mitigating unemployment which, at 10,951,000, is claimed by the federation to exceed the number of unemployed in March, 1933.

¶A less dismal view of unemployment is taken by the National Industrial Conference board, New York, which estimates unemployed workers in September at 9,976,000. The board's high in March, 1933, was 13,175,000 idle.

## How Foreign Steel Undercuts Domestic at Seaboard

| | Imports 1933 Value per lb. | *Export Prices f.o.b. Channel Ports per lb. | Ocean Freight and Charges per lb. | U. S. Import Duty per lb. | Current Foreign Steel Del. N. Y. per lb. | Current Domestic Steel Del. N. Y. per lb. |
|---|---|---|---|---|---|---|
| Steel bars | 0.83c | 1.16c | 0.25c | 0.30c | 1.71c | 2.13c |
| Sheet iron and steel, No. 24 | 1.29c | 1.63c | 0.30c | 0.45c | 2.38c | 2.73c |
| Structural iron and steel | 0.85c | 1.16c | 0.25c | 0.20c | 1.61c | 2.13c |
| Hoop or band iron or steel | 1.02c | 1.47c | 0.30c | 0.25c | 2.02c | 2.18c |

*From magazine STEEL for Oct. 1.

# Tariff

AMERICAN Iron and Steel institute last week protested to the United States tariff commission against any reduction in duties on iron and steel imports from Belgium, alleging that such imports constitute a serious menace to the domestic and industry and are detrimental to American workmen.

The statement, authorized by directors of the institute and signed by Walter S. Tower, executive secretary, was precipitated by negotiations for new duties on Belgian imports under a reciprocity agreement of the type the administration is attempting to negotiate with many foreign countries to facilitate American exports. The statement in part follows:

The low labor costs of European steel producers compared with the much higher labor costs prevailing in the United States enable the European producers to ship their products into markets along the Atlantic, Gulf and Pacific coast seaboards of the United States and even to penetrate markets in the interior of the United States at delivered prices to or below the cost of production of similar products made by domestic steel producers (see table below).

The present basic rate of wages in the Pittsburgh, Youngstown, Cleveland and Chicago districts for common labor in the steel industry is 47 cents per hour. The average hourly wages actually paid in August, 1934, in the United States under the steel code to all employes receiving hourly, piecework or tonnage rates was 63 cents per hour. If all employes including salary and wage earners are included, the average actually paid was 72 cents per hour. According to the best information available here, the highest wage rate for common labor in any European steelmaking country does not exceed 30 cents per hour.

In the production of a ton of steel, approximately five tons of raw materials such as iron ore, coal, limestone, etc., are required and the transportation of such materials is a most important source of revenue to railroads serving the various steel producing districts. When foreign steel products are imported, the American railroads secure the transportation only of the tonnage of steel so imported, and in fact, get no transportation of any sort in the event that the foreign steel is purchased for consumption at seaboard points.

# Durable Goods

REPRESENTATIVES of the durable goods industries conferred in Washington Friday, in connection with standardizing trade practice proposals and definitions of industries in their codes. Deputy Administrator

B. S. King, at the request of the representatives of the industries, called the meeting.

It was explained that actual consolidation of codes is not contemplated, the object being to consider methods of making definitions of industries and trade practice provisions consistent and effective.

Col. George S. Brady, assistant NRA administrative officer, told the meeting that "most of the bugaboo of code interference will disappear if code authorities get together and agree upon labor provisions in similar industry groups".

## Transportation

REQUIREMENTS for freight cars for transporting 29 principal commodities, as estimated by regional shippers' advisory board, will total 4,618,359 for the fourth quarter, an increase of 2.2 over the 5,520,780 cars loaded in final quarter of 1933

Estimates of cars required for principal industries for the last quarter, with the increase or decrease from the fourth quarter of 1933 include: Iron and steel 204,317, off 4.8 per cent; coal and coke 1,830,206, up 4.4 per cent; ore and concentrates 134,235, off 21.6 per cent; machinery and boilers 20,063, up 6 per cent; automobiles 61,465, up 42.8 per cent.

### NEW CAR IS ALLOY STEEL

Pressed Steel Car Co., Pittsburgh, has anounced a new light-weight hopper car weighing 30,000 pounds, having a capacity of 69½ tons. A saving of 13,000 pounds, the weight is ascribed to the use of alloy steel. This car is expected to save $125 a year in cost of hauling, $50 less in maintenance, and have a life of 15 years before heavy repairs, compared with 10 for present equipment.

## PWA

LOANS totaling $2,270,000 to five large railroads will result in seven more streamlined high-speed passenger trains by spring, according to PWA. These loans include $900,000 to the Baltimore & Ohio, $350,000 to the Gulf, Mobile & Northern, $500,000 to the Illinois Central, $300,000 to the New Haven, and $220,000 to the Boston & Maine.

## Housing

TENNESSEE COAL, IRON & RAILROAD CO. has issued four booklets calculated to develop a closer alliance between agriculture and industry in the South and to instruct farmers in erecting buildings with standard lengths of steel sheets. Advantages claimed for steel-sheathed buildings are economy, durability, cleanliness, weather-resisting, and fire and lightning proof.

## NRA

PRESIDENT ROOSEVELT Friday issued an executive order extending the automobile code to Feb. 1 without change. He thus over-rode the protest of the American Federation of Labor, which sought a hearing on the code in order to knock out the so-called merit clause. The President's order is regarded as a victory for the industry and for conservatism.

A provision in the executive order calls for a study of the possibilities for stabilizing employment in the automobile industry. A conference of labor and employers to consider this will be called on the President's return to Washington, probably in a few days.

### CODE BUDGET REQUESTS

For secondary steel products warehouse trade, $7505; metal etching industry, $15,000; chain manufacturing industry, $29,578; hoist engine manufacturing industry, $4500; drop forge industry, $85,000.

## Production

STEELMAKING production lifted 1½ points last week to 27 per cent, highest rate since the second week of August. Any deviation from this level is likely to be on the up side rather than the down, providing expected schedules at Chicago and east-

# Ballots Show Feeling Against New Deal Policies Is Mounting Week by Week

COMPILATION of the vote on STEEL's ballot on the new deal cast by visitors to the foundry show held in conjunction with the annual convention of the American Foundrymen's association at Philadelphia, Oct. 22-26, now affords a comparison of the vote at three national expositions.

The vote at Philadelphia confirms the trends displayed by the balloting at the exhibition held by the Association of Iron and Steel Electrical Engineers in Cleveland, Sept. 18-20, and at the national metal show held under the auspices of the American Society for Metals in New York, Oct. 1-5. The detailed results of these polls were presented in previous issues of STEEL.

However, the most noticeable characteristic of the vote, which is shown in percentages in the accompanying tables, is the consistent shift of sentiment against new deal policies. Study of the returns shows that opinion on this score was voiced more positively at each succeeding exposition.

For example, consider the vote on the new deal. At Cleveland in mid-September the vote was 45 per cent for the new deal and 55 per cent against. Ten days later at New York, the balloting was 43 per cent in favor and 57 per cent against the new deal. Two weeks later at Philadelphia the vote was 35 for and 65 per cent against.

This progressive increase in the positiveness of the vote against present administration policies also was manifested in the answers to the other five questions on the ballot.

### Results of Vote by Percentages

| | In 1932 I voted for: | | | | Had I known then what I know today I would have voted for: | | | |
|---|---|---|---|---|---|---|---|---|
| | Roosevelt | Hoover | Thomas | Foster | Roosevelt | Hoover | Thomas | Foster |
| Total ballots of 3 shows | 34 | 62 | 3 | 1 | 43 | 52 | 4 | 1 |
| A. I. S. E. E. (Sept. 18-20) | 32 | 65 | 3 | 0 | 45 | 51 | 4 | 0 |
| A. S. M. (Oct. 1-5) | 35 | 59 | 5 | 1 | 43 | 51 | 3 | 3 |
| A. F. A. (Oct. 22-26) | 33 | 65 | 2 | 0 | 37 | 61 | 2 | 0 |

| | In the early days of present administration, I | | Today, I | |
|---|---|---|---|---|
| | Favored New Deal | Did not favor New Deal | Favor New Deal | Do not favor New Deal |
| Total ballots of 3 shows | 69 | 31 | 43 | 57 |
| A. I. S. E. E. (Sept. 18-20) | 74 | 26 | 45 | 55 |
| A. S. M. (Oct. 1-5) | 65 | 35 | 43 | 57 |
| A. F. A. (Oct. 22-26) | 69 | 31 | 35 | 65 |

| | In my opinion, the New Deal has | | In my opinion, NRA has | |
|---|---|---|---|---|
| | Helped me personally | Harmed me personally | Helped my company | Harmed my company |
| Total ballots of 3 shows | 46 | 54 | 45 | 55 |
| A. I. S. E. E. (Sept. 18-20) | 48 | 52 | 46 | 54 |
| A. S. M. (Oct. 1-5) | 44 | 56 | 44 | 56 |
| A. F. A. (Oct. 22-26) | 43 | 57 | 42 | 58 |

ern Pennsylvania are maintained.

Gains in the Chicago, eastern Pennsylvania, Youngstown, Wheeling, Birmingham and Buffalo districts contributed to the advance last week. If automotive specifications are released in any great volume this quarter, the outlook is for additional expansion. Details for various districts follow:

**Youngstown**—Gained 4 points last week to 30 per cent; due largely to finished steel output, increased automobile steel buying, and resumption of improvement. One sheet plant is idle. This rate is expected to hold at this week's start.

**Chicago** — Rose 2½ points to 30 per cent last week, the best rate since late August and comparing with the September low mark of 22 per cent. Further slight improvement is expected this week. Blast furnace schedules at steel plants are unchanged, with eight of 36 steelworks stacks active, but the merchant stack of Interlake Iron Corp. has been blown out.

**New England**—Off 10 points to 30 per cent last week, with indications most of this loss will be regained this week. One works, with all open hearths down, expects to resume with at least one unit.

**Central eastern seaboard**—Up fractionally to 20½ per cent last week. The immediate outlook is for further slight improvement.

**Pittsburgh**—Down 2 points to 19 per cent, because of losses recorded in ingot melting rates by the two leading local interests. The smaller steelmakers here are all maintaining schedules above this average.

For this week no immediate change is anticipated in steelmaking schedules and the 19 per cent rate will probably continue.

Fifteen out of 60 steelworks blast furnaces continued in operation, although most are operating under a restricted blast. Of the 15 active, seven are independent furnaces and

(*Please turn to Page* 91)

**OCTOBER IRON PRODUCTION**

| | No. in blast last day of Oct. | Sept. | Total tonnage Merchant | Nonmerchant |
|---|---|---|---|---|
| Ohio | 15 | 13 | 37,365 | 180,696 |
| Penna. | 21 | 18 | 19,404* | 238,967* |
| Alabama | 4 | 5 | 35,189 | 23,474 |
| Illinois | 4 | 5 | 39,223 | 48,871 |
| New York | 6 | 6 | 46,998 | 30,835 |
| Colorado | 1 | 1 | | |
| Indiana | 5 | 5 | | 153,608 |
| Maryland | 2 | 2 | | |
| Virginia | 0 | 0 | | |
| Kentucky | 1 | 1 | | |
| Mass. | 0 | 0 | | |
| Tennessee | 0 | 0 | | |
| Utah | 1 | 1 | 7,802 | 89,108 |
| West Va. | 2 | 1 | | |
| Michigan | 3 | 3 | | |
| Minnesota | 0 | 0 | | |
| Missouri | 0 | 0 | | |
| Total | 65 | 61 | 185,981* | 765,559* |

*Includes ferro and spiegeleisen.

# October Iron Output Makes Small Gain; Stacks Up 4

EXPANDING blast furnace operations produced a small increase in the average daily output of coke pig iron in the United States during October and thereby arrested the five-month decline which started last June. According to statistics collected largely by telegraph, the daily production rose 2.4 per cent and active stacks increased from 61 on the last day of September to 65 on Oct. 31.

**AVERAGE DAILY PRODUCTION**

| | 1934 | 1933 | 1932 | 1931 |
|---|---|---|---|---|
| Jan. | 39,537 | 18,348 | 31,336 | 55,337 |
| Feb. | 45,385 | 19,752 | 33,122 | 61,114 |
| Mar. | 52,438 | 17,484 | 31,194 | 65,448 |
| Apr. | 57,873 | 20,786 | 28,524 | 66,986 |
| May | 66,370 | 28,784 | 25,282 | 64,355 |
| June | 64,563 | 42,165 | 20,867 | 54,599 |
| July | 39,630 | 58,108 | 18,394 | 47,170 |
| Aug. | 34,199 | 59,137 | 17,035 | 41,264 |
| Sept. | 29,969 | 50,264 | 19,788 | 38,947 |
| Oct. | 30,695 | 43,824 | 20,795 | 37,831 |
| Nov. | | 36,124 | 20,858 | 36,727 |
| Dec. | | 38,456 | 17,650 | 31,625 |
| Av. | 46,026 | 36,223 | 23,699 | 50,035 |

Average daily output was 30,695 gross tons, which, compared with the 29,969-ton rate of September, was an increase of 726 tons per day. The production in August was 34,199 tons, while in October, one year ago, the daily rate was 43,824 tons.

Total production of iron in October was 951,540 gross tons, a gain of 52,465 tons over the 899,075 tons of the preceding month. This was an increase of 5.8 per cent, however, it should be pointed out that October was a one-day longer month than September. Output in August was 1,060,187 tons; in October, 1933, it was 1,358,540 tons.

Pig iron made in the United States in 10 months has aggregated 13,991,954 gross tons, an increase of 3,046,123 tons, or 27.8 per cent, over the corresponding period of 1933. In 1932, the 10-month total was only 7,501,135 tons, while in 1931, it amounted to 16,180,814 tons.

Relating production to capacity, the rate of output for October was 22.1 per cent. This compares with 21.5 per cent in September, 24.5 per cent in August, 28.4 per cent in July, 46.3 per cent in June and 47.5 per cent in May, the latter being the high point for the year. The operating rate for October, one year ago, was 31.8 per cent.

Active blast furnaces on Oct. 31 totaled 65, this comparing with 61 on Sept. 30, 61 on Aug. 31 and 74 on July 31. The largest number operating this year was 117 on May 31. On Oct. 31, 1933, active units totaled 81. During the month, 8 furnaces were blown in and 4 were blown out or banked, the net gain being 4 furnaces. Of the steelworks or nonmerchant class, 7 were blown in and 1 blown out; of the merchant class, 1 resumed operation and 3 were taken out.

**MONTHLY IRON PRODUCTION**

| | 1934 | 1933 | 1932 |
|---|---|---|---|
| Jan. | 1,225,643 | 568,785 | 971,437 |
| Feb. | 1,270,792 | 553,067 | 960,550 |
| Mar. | 1,625,588 | 542,013 | 967,015 |
| Apr. | 1,736,217 | 623,606 | 855,734 |
| May | 2,057,471 | 892,326 | 783,769 |
| June | 1,936,897 | 1,264,953 | 626,015 |
| July | 1,228,544 | 1,801,345 | 570,222 |
| Aug. | 1,060,187 | 1,833,265 | 528,105 |
| Sept. | 899,075 | 1,507,931 | 593,640 |
| Oct. | 951,540 | 1,358,540 | 644,648 |
| 10 mo. | 13,991,954 | 10,945,831 | 7,501,135 |
| Nov. | | 1,083,740 | 625,753 |
| Dec. | | 1,192,136 | 547,179 |
| Total | | 13,221,707 | 8,674,067 |

Furnaces blown in during October were: In Ohio; River No. 2, Corrigan-McKinney Steel Co.; one Haselton, Republic Steel Corp. In Pennsylvania: National No. 1, National Tube Co.; one Eliza, Jones & Laughlin Steel Corp., one Monessen, Pittsburgh Steel Co.; Bethlehem F, Bethlehem Steel Co. In New York: One Lackawanna, Bethlehem Steel Co. In West Virginia: Riverside, Wheeling Steel Corp.

Furnaces blown out or banked during October were: In Pennsylvania: Bethlehem G, Bethlehem Steel Co. In New York: One Buffalo, National Steel Corp. In Illinois: One Federal, Interlake Iron Corp. In Alabama: One Pioneer, Republic Steel Corp.

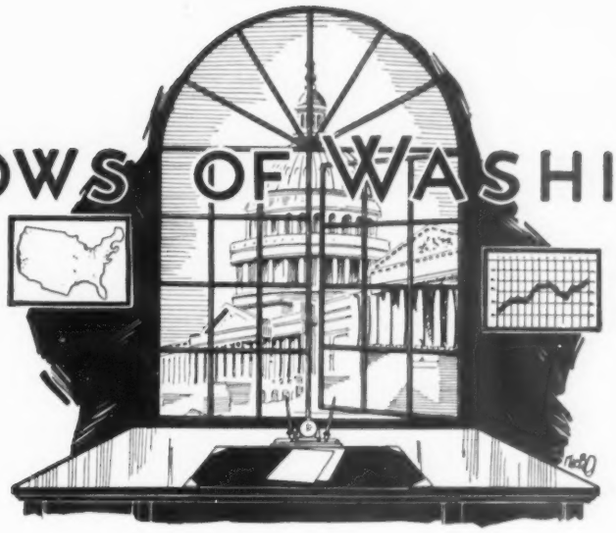
**RATE OF OPERATIONS**

(Relation of Production to Capacity)

| | 1934[1] | 1933[2] | 1932[3] | 1931[4] |
|---|---|---|---|---|
| Jan. | 28.3 | 13.3 | 22.1 | 38.4 |
| Feb. | 32.5 | 14.3 | 23.4 | 42.5 |
| Mar. | 37.5 | 12.7 | 22.0 | 45.4 |
| Apr. | 41.4 | 15.1 | 20.2 | 46.5 |
| May | 47.5 | 20.9 | 17.9 | 44.7 |
| June | 46.3 | 30.6 | 14.7 | 37.9 |
| July | 28.4 | 42.4 | 13.0 | 32.7 |
| Aug. | 24.5 | 42.8 | 12.0 | 28.7 |
| Sept. | 21.5 | 36.4 | 14.0 | 27.0 |
| Oct. | 22.1 | 31.8 | 14.7 | 26.3 |
| Nov | | 26.2 | 14.7 | 25.5 |
| Dec. | | 27.9 | 12.5 | 22.0 |

[1]Based on capacity of 50,975,561 gross tons, Dec. 31, 1933; [2]on capacity of 50,313,975 tons, Dec. 31, 1932; [3]on capacity of 51,598,175 tons; [4]on capacity of 52,515,875 tons. Capacities by American Iron and Steel institute.

# WINDOWS OF WASHINGTON



*WASHINGTON*

EXPORTS of iron and steel from United States reached a new high record in September when they totaled 301,330 gross tons. Not in any month since the iron and steel division of the department of commerce was set up in 1921, and probably only during the peak of World war shipments, has the outward movement approached this figure.

But the picture is distorted if the role of scrap is not considered. In September, scrap exports alone reached 225,212 tons, an increase of 70,000 tons over August and almost six times the shipments of September, 1933. In the first nine months of 1934 a total of 1,275,414 tons of scrap has moved out of the country.

The answer in September, as in previous months, is Japan. For 1934 through September, Japan has taken 779,334 tons, or approximately 60 per cent of the movement. Italy and Poland are a poor second and third, but account for the bulk of the remainder.

While the iron and steel division swells with pride at this apparent world demand for the products it is supposed to foster, its feelings are tempered by the regret that scrap as an export contributes little to domestic activity. So far as providing employment, it is almost a total loss.

### TURN TO AMERICAN MARKETS

This scrap takes out of the country iron ore, coke, limestone and other materials which are irreplaceable, yet Pittsburgh and other consuming districts in the interior are not at all interested in it because the freight from the seaboard would equal or exceed the original cost.

There is a growing feeling in Washington that nearby Canada and Mexico and Central and South America are the real markets to build up for iron and steel. Outside of scrap, Japan in nine months has taken only 56,227 tons, mostly tin plate and wire rods. On the other hand, Canada has purchased 213,438 tons of iron and steel, Brazil 71,759 tons, Venezuela 34,404 tons, and Argentina 31,871 tons.

Comparing grand divisions, South America has absorbed 205,013 tons of iron and steel from the United States in nine months this year, against only 73,058 tons a year ago. North and Central America and the West Indies, including Canada, have taken 360,691 tons, against 139,829 tons a year ago. Asia and Oceania have bought 990,372 tons (of which 779,334 tons was scrap for Japan) contrasted with 501,542 a year ago.

Japan, incidentally, is understood to be building up a three-year reserve of scrap to safeguard against any interruption of supply. Washington believes the chief possible interruption would be war.

### LIGHT RAILS TO ORIENT

China has been an active buyer of light rails recently, in fact almost cleaning out the supply in the United States. Getting up into the range of 85-pound rails, Chinese buyers encounter domestic competition from relaying interests and are quoted about the same price as new 60-pound rails. Hence, there has been a slight slowing up in Chinese buying recently.

Egypt recently bought 2000 tons each of heavy and light old rails 75 and 35 pound, respectively, to be used for boundary and trail markers. The specification is that one end must be cut smooth, and the rail to be cleaned and tarred or dipped in some noncorrosive solution.

METHODICALLY, Joseph B. Eastman, co-ordinator of railroads, is moving upon every possible angle of railroading and last week he reached scrap.

A questionnaire to all railroads is calculated to develop information on (1) the costs of handling and preparing scrap for the market and the net revenue accruing to the railroads through the sale of scrap; (2) the advantages and disadvantages of dismantling equipment versus sale "on wheels," or dismantling by outside agencies; (3) the possibilities for economy through the establishment of central scrap plants to serve two or more roads, and (4) the relative position of the railroads as scrap producers.

### QUESTIONNAIRES DELUXE

Statistics also are asked on the total amount of scrap originated by the railroads from 1929 to 1933, the amount shipped direct from point of origin, and the amount handled through scrap sorting plants, for both ferrous scrap and nonferrous metal scrap. The amount of each class of prepared scrap shipped during 1933 and the market into which it moved will be determined, together with the money received for the scrap.

This questionnaire on scrap is just another proof that Mr. Eastman is heaven's gift to statisticians. Most voluminous questionnaires have been issued by him on almost every conceivable phase of railroad operation. Recently, one went to freight solicitors, asking them to detail by hours exactly how they spent their time for a given week, including time spent for entertainment, riding and soliciting. These solicitors were even asked to report on their competitors, whether they were attractive or repellent and whether they obtained their business through entertainment or genuine selling.

GREAT interest has been displayed by the government in the Union Pacific railroad's streamline train run from Los Angeles to New York, with the consensus of opinion that steel has not a great deal to worry about at the present time. Even W. Averill Harriman, chairman of the Union Pacific, said at the conclusion of the record run that while two complementary trains were being ordered, the public could

not expect regular or frequent service for several years.

While no official reports are available, it is said that the lack of weight was noticeable at high speeds. One western road, incidentally, has recently taken a small high-speed train out of service because it could not hold the rails at the desired speeds.

It is noteworthy that east of Chicago the Union Pacific train was held down to steam schedules, bettering the time of the Twentieth Century from Chicago to New York by only 20 minutes.

### POSSIBLE RAIL ALLIANCES

Since the Union Pacific appears to have teamed up with the New York Central, the speculation is whether the Burlington with its stainless steel Zephyr will play ball with the Pennsylvania. The latter, however, is a clannish road and disposed to view with suspicion any equipment built outside of its shops or on specifications other than its own.

The feeling in Washington is that greatly improved track conditions are pre-requisite to steady service at high speeds. Rails at 110 pounds or more to the yard appear heavy enough, but improved fastenings, straightening out of curves and elimination of grade crossings are held to be essential. In all these, steel stands to benefit.

The Edward G. Budd Mfg. Co., Philadelphia, which made the Burlington Zephyr, announced last week it is prepared to use its shotweld process in quantity production of light-weight high speed trains of stainless steel. The shop in which the Zephyr was built is now being operated entirely in the manufacture of structural stainless steel parts for the navy, and railroad building equipment has been installed in another Budd plant in Philadelphia.

GIVE the Tennessee Valley Authority the personality and vocabulary of a Johnson and it would hand industry as bad a case of the jitters as NRA did.

In the early stages of planning the Norris and Wheeler dams, TVA foresaw it would be a large buyer of cement. Immediately it visualized a plant at Sheffield Ala., supplied by electricity from its own projects.

Cement manufacturers, anxious to head off government competition and additions to an already overbuilt industry, (annual capacity 270,000,000 barrels; 1933 output 64,000,000 barrels) went to TVA, books in hand, and laid every card concerning costs face up.

TVA officials reached a fairly complete agreement with the manufacturers in regard to manufacturing costs, but on interest, depreciation and selling costs their minds could not meet.

With the threat of a government plant hanging over the industry, TVA recently took bids on 800,000 barrels for the Norris dam and 700,000 barrels for the Wheeler dam. Bids for the former were $1.74 a barrel, for the latter $1.88. By comparison, the open market on cement is $2.45 a barrel when delivered to the site in carloads, although certain allowances and discounts lower the net prices to something below $1.90.

Having won victory for the time being, TVA is submerging its ambition to build a cement plant, although believing that it is paying more than the probable cost of making cement at Sheffield.

Announcing this policy, TVA said officially the other day that "cement manufacturers, rather than to have another plant built, have bid prices which they hold are less than fair prices, especially at the low rate of production now prevailing in the industry, and they have met the maximum price which the Authority was willing to pay."

### SAME LEVER ON STEEL PRICES

The parallel for the steel industry would be for TVA to threaten to build a steel mill and roll the shapes, concrete reinforcing bars and other products it will utilize; induce steel makers to rush to Washington and Knoxville with their books, and then accept a quotation below the market as the price for relinquishing its program to build its own capacity.

The fact is, TVA already is threatening to make stainless steel and has announced that it is conducting experiments in its laboratory at Knoxville. Having an abundance of electricity, and having read in a book that stainless steel is chiefly made in the electric furnace, TVA sees no obstacle whatever to the production of enormous quantities of stainless steel for consumption in what it visualizes as a vast southern market.

A year ago TVA made extensive studies on the production of ferromanganese from local ore. Presumably, the large known body of iron ore in the Tennessee valley will form the basis for other experiments in iron and steel production, although the fact is private capital has never been able to make any headway on account of the low grade of the ore.

TVA drew a blast from the American Gas association's convention in Atlantic City last week, when its competition was declared "unjust and unfair," its motives "punitive in nature" and its program contrary to the promised "orderly and proper development."

THEY are turning the heat on PWA Director Ickes good and plenty in shaping up the new public works program for 1935.

Last year Secretary Ickes favored waterworks and sewers in putting out PWA money. From the White House down, there is a feeling something ought to be done for the heavy industries, and hence a plan to allot a larger proportion of new PWA money for equipment and materials and cut down on the common labor.

This plan includes much grade crossing elimination. The bureau of public roads recently asked all state highway directors to recommend the elimination of the worst death traps. The discussion of high speed streamline trains is a publicity factor helping the grade crossing program, behind which is the American Institute of Steel Construction.

Estimates of public works run as high as 12 billion dollars. There probably will be a civil works program, with the emphasis more on materials than labor. Relief Administrator Hopkins is being made the clearing house for all projects.

Several months ago this department forecast that, the November elections being "in the bag," federal expenditures would be held back a little in order to make 1935 a bang-up year.

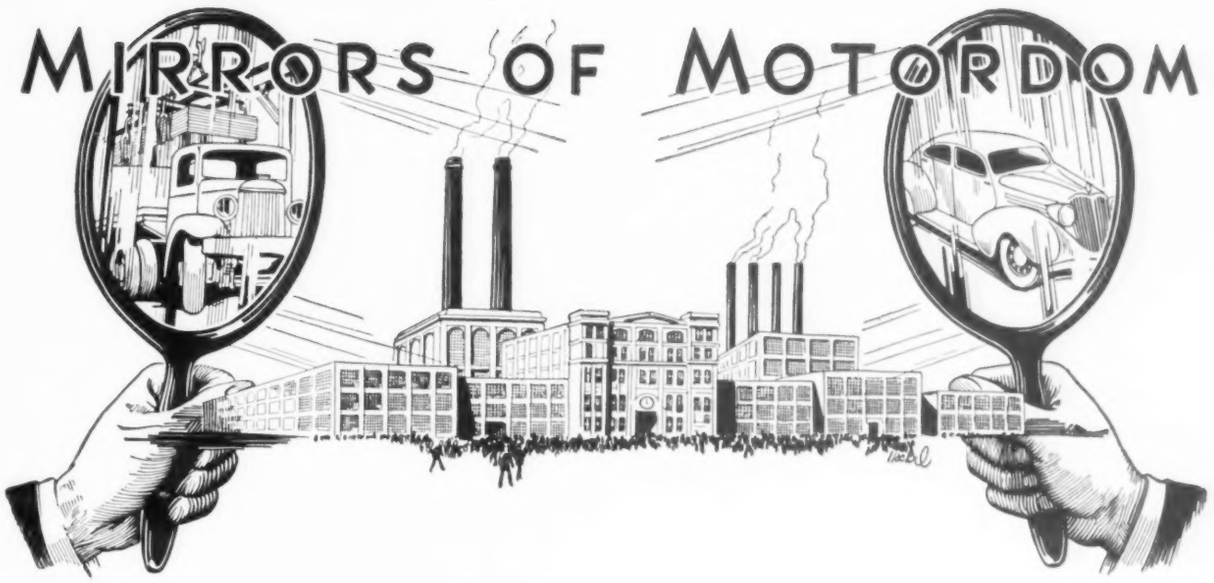
Factors outside the government also point to a big 1935. Ford is talking of a million-car year; Carnegie Steel is building a wide strip mill; two big car dumpers will be built on Lake Erie; Chrysler plans an assembly plant at Baltimore; the next ten days may see other big projects maturing.

It would be "Roosevelt luck" to have private business complement enormous federal expenditures, making 1935 a good year and setting the stage for the presidential election of 1936.

FOR canning cattle purchased in drought areas last summer the government required 58,254 tons of tin plate. . . . A nationally-known steel executive who wrote in a national weekly recently that pig iron imports have reached 450,000 tons a year confused his figures. Since 1927, the largest import of iron in any year was the 158,596 tons in 1933. In 9 months of this year, 99,691 tons has been received.

### GOOD NEWS: NO NRA NEWS

A. R. Glancy, former General Motors executive who got into a row with organized labor when he restored the Blue Eagle to the Harriman mills in Tennessee, is back with NRA. . . . Almost daily some army officer whom General Johnson drafted for NRA is returning to his former post. . . . W. Averill Harriman, chairman of the Union Pacific railroad and former NRA division administrator, looms up as next important to S. Clay Williams. . . . Only once since he took office as chairman of the new NRA advisory board in mid-October has Mr. Williams had a press conference. For news purposes, NRA is now considered dead.




*DETROIT*

THE automotive industry last week was not convinced that it had the green light and could speed ahead in its preparations for the introduction of new models.

It may have been the uncertainty resulting from the reappearance of the labor problem, due to the expiration of the automobile code Nov. 3, which in the light of the President's extension of the code unchanged to Feb. 1 was a needless worry. Or it may have been the fact that stocks of cars in dealers' hands are declining a little less rapidly than had been expected.

Despite this, however, orders for sheets, strip and other rolled products distributed by Ford, Chrysler and General Motors improved moderately, believed to be the forerunner of heavier buying. Ford is reported to have released material for 15,000 cars, and it is reported assembly of its new models will be started this month. Chrysler has placed a substantial order for chassis frames, and General Motors units for several thousand tons of sheets and strip.

### DIE SHOPS ARE BUSIER

While there has been a general absence of pressure on tool and die shops to complete their programs, the latter work is progressing steadily. One shop is operating 75 per cent whereas ordinarily it should be running 150 per cent at this time.

Although dealers' stocks are ebbing, aided by the cessation of assemblies by the majority of builders and by clearance sales at reduced prices, they probably will not reach the volume desired until late in the quarter, hence there is little necessity from this standpoint for the industry to push deliveries of new models. During the remainder of the year there will be a growing tendency for the public to defer its buying until the introduction of 1935 cars, so that manufacturers now can gage approximately the date on which announcements of the new offerings will be most propitious.

One exception to a more or less leisurely procedure in new model preparations is Chevrolet which, it is understood, has projected a major redesign of its intended offering, particularly the front end, and last week was rushing preparations to accommodate this change so as not to delay initial production of the new cars longer than necessary.

This about-face is reported to have involved the scrapping of a large number of dies originally intended to be used in building the 1935 series, and while it had been planned to continue output of present models until the middle of this month, the shutdown may come earlier. Assembly lines are expected to reopen early in December unless these last-minute plans cause serious delays. The 1935 Chevrolet, it is indicated, will depart considerably in design from its predecessors of the past two years which, in appearance, had much in common.

Ford also will correct the sameness which characterized its last two models, and the extent of this change is credited in part for the activity of its principal competitors in their attempts to counter with similar revisions. Ford, as usual, continues to be the principal fountain head for the many rumors concerning new designs which regularly gush from this district during the period when the industry is in the midst of swinging from old models to new but which, in a number of instances, are given an "interesting if true" status.

### FORD RUMOR CROP HEAVY

One story credits Ford with having adopted roller bearings for its main crankshaft supports, while another indicates that the new V-8 motor will drop the aluminum head for a combination copper and iron type. The latter, being produced by an independent foundry, employs a copper plate inserted in an iron casting and is said to give superior properties of heat dissipation, with consequent improvement in anti-knock qualities and gasoline economy. The fact is, Ford has continued to experiment with roller bearings for crankshafts, but those "in the know" scout their adoption this year.

Henry Ford's announcement last week that he plans to make a million cars in 1935 netted him the most publicity of any stunt since he stood on the steps of the White House late in 1929 and raised wages of his workmen. That, of course was the objective of his latest manifesto.

Unquestionably, Ford is pointing toward a big year next year. His advertising, radio broadcasts and "stunt" publicity support this. The addition of his steelworks is another factor. Nevertheless, the million cars

## Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

| | 1932 | 1933 | 1934 |
|---|---|---|---|
| January | 119,344 | 130,087 | 156,907 |
| February | 117,418 | 106,888 | 231,707 |
| March | 118,959 | 118,002 | 331,263 |
| April | 148,326 | 180,713 | 354,745 |
| May | 184,295 | 218,347 | 331,641 |
| June | 183,106 | 253,387 | 308,051 |
| July | 109,143 | 229,357 | 266,575 |
| August | 90,325 | 232,855 | 234,809 |
| September | 84,150 | 191,800 | 168,872 |

*Estimated by Cram's Reports*

| Week Ended | |
|---|---|
| Oct. 6 | 18,998 |
| Oct. 13 | 25,491 |
| Oct. 20 | 29,069 |
| Oct. 27 | 23,626 |
| Nov. 3 | 17,116 |

is only a hope at this time. Releases for material for a million cars will not be issued right away. Nor are Chevrolet and Chrysler sleeping.

Ford estimates that to produce a million cars $53,600,000 worth of steel will have to be bought, in addition to that produced at the Rouge works. Also, freight bills will total $74,000,000, nonferrous metals $12,000,000, tires $22,500,000, lumber $3,000,000, $100,000,000 for bodies and $32,000,000 for finishing them.

Ford has completed production of 1934 models and preparations for the start of assemblies of the new car are well advanced, probably getting under way the latter part of November. In the meantime, the Ford steelworks continues busy piling up semifinished steel in anticipation of the shutdown that will be necessary next March as a result of a rearrangement of mill facilities and the addition of the new continuous mill. Ford is planning to reopen its assembly plant in St. Louis, which had been closed for two years. The plant will reopen in time to start production of 1935 models.

Plymouth has built six "pilot" cars of its new series, marking one of the steps preparatory to the start of active assemblies. The latter has been delayed, somewhat, however, and is unlikely to get going until after mid-November.

### FENDERS V-SHAPED

Front fenders of the new models approximate a cross between those of the Oldsmobile and LaSalle this year, including the V ridge down the middle of the top section as used by the latter.

The Plymouth rear end is streamlined, approaching the slope of the airflow models in this respect, while the front end is longer and narrower than the current series.

While Chrysler will be enlarging its repertoire of conventional type cars through the addition of a DeSoto of this design, at the same time retaining the airflow model, it is reported that a third airflow will be sponsored by Dodge as a companion to this company's conventional series. Dodge has fared better than a number of other companies in cleaning up dealer stocks, recent price adjustments having stimulated sales. Practically no surplus of old cars is anticipated when shipments of 1935 models start.

Chrysler will build a large assembly plant at Baltimore, to offset Chevrolet's plant at Baltimore and Ford's at Norfolk, Va. This is another indication of a tighter competitive situation.

Developments in the radio industry are given credit for making possible the approaching use of more steel in automobile body building. As reported previously, some manufacturers will employ an all-steel top instead of soft fabric material on new models, and the steel-roofed body will be featured in 1935.

This type of construction would have been used before were it not for the drumming or diaphragm effect that resulted when a steel sheet was located over the top. New knowledge of acoustics, contributed largely by discoveries in connection with the handling of audible vibration frequencies in radio, has solved the rumble problem, however, and made the steel roof practicable. In addition it has given added meaning to the term, all-steel body.

### DELAY STEEL BUYING

Pontiac, the first of the General Motors units to suspend assemblies this fall, has yet to start building new cars. This is expected to develop soon since stocks have been reduced considerably during the past two months, particularly following the recent reduction in dealers' prices. Inventories still are fairly large, however. As in the case of several other manufacturers which were counted on to launch new model production by late October or early November, delays have postponed steel purchases longer than was anticipated 30 or 60 days ago, and releases in any large volume by the industry as a whole seem likely to be put off for another two to three weeks.

Suspension of assemblies last week by Ford left only Chevrolet among the larger producers active. Buick, with no immediate model changes in prospect, is outstanding in the medium-price field, building more than 1000 units weekly.

Graham continued last week at 60 units daily for three days and has a tentative schedule of 400 to 450 units for November. Assemblies of new models are not expected to start until late December. The small six that Graham will introduce next year in general will follow the front end and body lines of the larger series but will have a tread about 3 inches narrower than the present models.

Although confirmation is lacking, L. A. Young Spring & Wire Corp. is reported to be acquiring a tract of land here on which will be built a plant for the production of steel wire, with an annual output of 40,000 to 50,000 tons annually.

Reo Speedwagons and commercial cars will be sold and serviced in 12 cities by retail agencies of the Mack-International Motor Truck Corp. as a result of a co-operative arrangement between the two companies. Passenger cars will not be sold and the deal will not interfere with the sale of commercial cars by Reo dealers and distributors in the territories affected. Reo has introduced new ½-ton and 1½-ton commercial cars.

Hupp last week closed its Cleveland body plant and shifted the business to Hayes Body at Grand Rapids.

# Here and There In Industry

LUNDBERG SCREW PRODUCTS CO., Lansing, Mich., has been formed by H. B. Lundberg, president and general manager; C. R. Morris, formerly secretary and purchasing agent for the Michigan Screw Co., vice president and treasurer; Ted Lundberg, formerly with the Michigan Aero-Engine Corp., secretary and superintendent; Myrtle Reeve, formerly with the Michigan Screw Co., assistant secretary. The Michigan Screw Co. was sold to the Federal Screw Works, Detroit, which later dismantled the plant. The Lundberg company has been formed to furnish facilities the Federal company formerly offered.

□ □ □

LeMoyne Alloys Co., a newly-formed company, has acquired the plant of the LeMoyne Steel Co., New Eagle, Pa., which has been closed since 1929 and will recondition the properties, planning to begin operations about Jan. 1.

Joseph W. Weitzenkorn, formerly president of the Molybdenum Corp. of America, heads the LeMoyne Alloys Co., which will produce molybdenum and tungsten alloys.

□ □ □

Rogers, Brown & Lavino Co., Philadelphia, New York and Boston, has been appointed agent in eastern territory for the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., for its Ensley, Ala., pig iron and for the Tonawanda Iron Corp., North Tonawanda, N. Y., for its Tonawanda and Buffalo pig iron.

□ □ □

Tyson Roller Bearing Corp., Massillon, O., has completed installation of additional production equipment which has doubled plant capacity. The new equipment includes carburizing furnaces for heat treatment of roller bearing parts. Volume of business has been double that of last year and each year since the company's formation in 1930 has shown a satisfactory growth.

□ □ □

The Standard Steel Car Corp. of Delaware, Canton, O., plant, has placed an order with the Timken Roller Bearing Co., at Canton, O., for four car sets of Timken roller bearings for freight car trucks, to be used under two flat cars of 100 tons capacity and two gondola cars of 100 tons capacity which Standard is building for Mesta Machine Co., Pittsburgh.

The Timken inboard type of freight car truck, which saves considerable weight over the outboard type truck, will be used under these four cars.

# Industrial Men in the Day's News

## Benjamin Franklin Shepherd, New President, American Society for Metals

For 23 years he has been with the Ingersoll-Rand Co., now managing the rock drill division.

A nationally recognized metallurgist, he is an authority on tool steels and carburizing.

His recent work in developing the P-F characteristic of tool steels has commanded attention.

BENJAMIN FRANKLIN SHEPHERD, recently elected president of the American Society for Metals (STEEL, Oct. 8, p. 12), is manager of the rock drill division of Ingersoll-Rand Co., Phillipsburg, N. J., a position he has held since May, 1933.

Born Sept. 6, 1893, in Phillipsburg, he graduated from Phillipsburg high school in 1911 and entered employ of Ingersoll-Rand in the same year. He spent six months in Texas in 1915 during mobilization of the Pennsylvania national guard on the Mexican border.

In 1918 he carried out research work at Columbia university as a special student of Dr. William Campbell. In 1929 he was named chief metallurgist of Ingersoll-Rand and held this post until his new appointment last year.

He is a recognized authority on tool steel and carburizing, and originated the Shepherd hardenability test and a set of fracture grain size standards. Lately he has been active in developing the P-F characteristic of certain tool steels, a correlation of penetration of hardness with fracture grain size (STEEL, May 14, Oct. 29).

He is a member of the American Society for Testing Materials, Iron and Steel Institute and Institute of Metals of Great Britain, American Institute of Mining and Metallurgical Engineers, Society of Automotive Engineers, Technical Association of the Pulp and Paper Industry, and a former vice president of the Engineers Club of the Lehigh Valley.

Previous to assuming office of president of the American Society for Metals, he was active for a year as vice president of this organization, and was a member of the board of directors in 1930-31.

□ □ □

Charles E. Stuart, president and treasurer of Tyson Roller Bearing Corp., Massillon, O., has resigned effective Nov. 1, after five years in this position. He will continue a member of the board of directors.

Russell E. Colgate, chairman of the board, has been elected president and treasurer, succeeding Mr. Stuart. Ralph H. Maxson is executive vice president in charge of operations, George C. McMullen vice president in charge of sales, George Neupower secretary, and E. R. Earnest assistant treasurer and purchasing agent.

□ □ □

L. M. Klinedinst has been named vice president in charge of sales and a member of the board of directors of Timken Roller Bearing Co., Canton, O., in the former position succeeding Judd W. Spray, recently resigned. Mr. Klinedinst has been associated with the company for 29 years, during early years having occupied various junior executive positions in both the manufacturing and selling divisions. Subsequently he was identified closely with automotive development work, serving as assistant sales manager. Thirteen years ago he was made general manager of the company's new industrial division. He has been vice president in charge of all industrial sales since 1930.

T. V. Buckwalter, for several years vice president of Timken Roller Bearing, has been elected vice president and a director of Timken Steel & Tube Co.

□ □ □

Ralph R. Weddell, consulting engineer who recently returned from England after establishing the manufacture of serrated blade cutters there, is now associated with the Ingersoll Milling Machine Co., Rockford, Ill., in charge of design and sale of small tools.

□ □ □

William C. Sutherland, vice president of the Pittsburgh Steel Co., Pittsburgh, and George P. Rhodes, director in several Pittsburgh enterprises, have been elected directors of the Pittsburgh Steel Co., Pittsburgh. They succeed W. S. Linderman and J. M. Schoonmaker Jr. on the directors' board.

□ □ □

C. M. Broome Jr., assistant district manager, has been placed in charge of a new sales office of American Rolling Mill Co., Middletown, O., located in the Citizens and Southern National Bank building, Atlanta Ga. The new office will serve Florida, South Carolina, Alabama, Georgia and parts of Tennessee and North Carolina.

C. M. Broome Jr.

□ □ □

George W. Starr has been appointed general manager of sales for the Ohio Ferro-Alloys Corp., Canton, O., effective Nov. 1. He has been closely identified with the iron and steel in-

dustry throughout his career, for some time being director of purchases for the United Alloy Steel Corp., now a unit of Republic Steel.

□ □ □

Floyd Rose, vice president and general sales manager of the Vanadium-Alloys Steel Co., Pittsburgh, well remembered as one of University of Pittsburgh's star athletes, acted as master of ceremonies at the university's annual homecoming celebration last week-end.

□ □ □

J. C. Vorhauer has been appointed director of purchases for the General American Transportation Corp., Chicago, and its subsidiaries, effective Nov. 1.

□ □ □

Thomas Bradley has been named director of purchases for the Hupp Motor Car Corp., Detroit. He is well-known in the purchasing field of the automotive industry, serving in a purchasing capacity with Paige-Detroit Co. and its successor Graham-Paige Motors Corp. from 1911 to 1933.

□ □ □

Alfred C. Rantsch, for 16 years engineering sales manager of the Doehler Die Casting Corp., Toledo, O., and for four years manager of Barnhard Bros. & Spingler, Chicago, has been named vice president and manager of Pressure Castings Inc., Cleveland, a company organized early this year to produce high-pressure die castings as exclusive licensee of die casting machines built by Reed-Prentice Corp., Worcester, Mass.

□ □ □

J. P. Williams, president of the Koppers Coal Co., Pittsburgh, was elected president of the National Coal association for the coming year at the association's recent annual convention in Washington.

# Died:

RUSSELL M. BENNETT, 69, owner of extensive iron ore properties on ranges in Michigan and Minnesota, philanthropist, banker and railroad director, in Minneapolis, Oct. 31. He was a director of the Brazilian Iron & Steel Co.

□ □ □

J. J. Rowbottom, secretary of the Diversey Foundry Co., Geneva, Ill., in Oak Park, Ill., recently.

□ □ □

James Potts, 84, for 52 years in the employ of American Steel & Wire Co., Cleveland, and retired for the past 13 years, in Cleveland, Oct. 30.

□ □ □

John B. Schlossberg, for many years superintendent and plant manager of the Highland Iron & Steel Co., Terre Haute, Ind., in Chicago recently. He was a director of the Terre Haute chamber of commerce.

□ □ □

Homer Augustus Wessel, president of the Cincinnati Railway Supply Co., Cincinnati, at his home in Briarcliff Manor, N. Y., Oct. 26.

□ □ □

Arthur Hayssen, 58, president and treasurer of the Hayssen Mfg. Co., Sheboygan, Wis., builder of special machinery, in Sheboygan, Oct. 21.

□ □ □

Samuel C. Van Dusen, 72, head of Dickerson, Van Dusen & Co., tin plate manufacturer, at his home in New York, Oct. 11.

□ □ □

C. Manning Combs, 64, for some years a resident of Cuba and at one time manager of the Spanish American Iron Co., in Baltimore, Oct. 29.

□ □ □

W. T. Williams, 72, formerly superintendent with Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., at his home in Pyriton, near Birmingham, recently.

□ □ □

Adam W. Kaufman, 61, secretary-treasurer of the Res Mfg. Co., Milwaukee, metal stamping and plating interest, in Milwaukee, Oct. 22, after an illness of eight months.

□ □ □

Walter J. Goodall, 74, retired vice president of W. J. Holliday & Co., large wholesale iron and hardware company, in Indianapolis, Oct. 28. He was with the company 48 years and retired in 1928.

□ □ □

Francis F. Spies, 63, retired New York machinery dealer who for the past 35 years had made a hobby of copying headstone inscriptions in rural eastern graveyards for use in genealogical and historical work, at his home in Hastings-on-Hudson, N. Y., Oct. 29.

□ □ □

O. H. McCornack, 57, former director of purchases, vice president in charge of sales and a member of the board of directors of Hudson Motor Car Co., Detroit, in that city, Oct. 30, after a two-year illness. He had been with Hudson since 1910.

□ □ □

Emery E. Dunning, 70, well known heating and ventilating engineer, and president of the Dunning Furnace Co., Milwaukee, in that city, Oct. 28. From 1899 to 1927 he was chief engineer of the old Schwab & Sercomb Co., Milwaukee, resigning to establish his own business.

□ □ □

James Horton, 81, veteran employe of Carnegie Steel Co., Pittsburgh, in that city recently. He was associated with Carnegie for over 53 years, at one time as master mechanic at the Homestead, Pa., works. Later he was consulting engineer on river transportation facilities for the company.

□ □ □

J. P. Orum, 59, superintendent of the Bessemer rolling mills, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., at the corporation hospital there recently, after lengthy illness. He had been with the United States Steel Corp. for 41 years, coming to Birmingham from Wheeling, W. Va., in 1913.

□ □ □

Harry Adams Chinn, 56, secretary to W. F. Pellenz, general superintendent for the Oliver Iron Mining Co., in the Virginia-Eveleth, Minn., district, in Virginia, Oct. 20. He was a brother of W. P. Chinn, iron ore mine manager for Pickands, Mather & Co., and had been identified with the mining industry 40 years.

□ □ □

Carl Sulzer-Schmidt, 69, famous industrialist and engineer, head of the Sulzer Bros Ltd. engine works and president of the Swiss Association of Machinery Manufacturers, in Winterthur, Switzerland, Oct. 30. For a number of years he was employed in this country by Brown & Sharpe Mfg. Co., Providence, R. I.

□ □ □

William F. McGuire, 60, for several years production manager of the Ford Motor Co., Detroit, in New York, Oct. 30. At one time he was associated with Gen. George Goethals, engineer in charge of construction of the Panama canal. After leaving the Ford company he reorganized the Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.

□ □ □

G. C. Farkell, 62, superintendent of rail and blooming mills for the National Tube Co., Lorain, O., in that city, Oct. 22. A graduate of Cornell university, he had been connected with National Tube since 1904 and previous to that time was associated with Carnegie Steel Co. in Homestead, Pa. He was a member of the American Iron and Steel institute and a nationally recognized authority on rolling and rail mill practice.

□ □ □

David D. Lewis, 79, who supervised the building of the first steel plant in Lorain, O., and who lighted the first blast furnace there in 1894, in Sebring, Fla., Oct. 10. He went to Lorain in 1894 with Tom L. Johnson and was superintendent of construction for the blooming mills and bessemer department of the Johnson company, later taken over by National Tube Co.

His brother, Jonathan D. Lewis, 75, for a time chemist in the Lorain steel plant and later superintendent of music in Lorain schools, died in Pittsburgh the same day.

□ □ □

Walter James Muncaster, 85, inventor and steel manufacturer, at his home in Cumberland, Md., Oct. 13. In his youth, after a period with the Novelty Iron Works, New York, and the Beall Foundry in Cumberland, he became one of the incorpo-

rators and main organizers of the Cumberland Steel Co., of which he served as vice president and general manager until his retirement in 1912. He patented a number of machines for turning, grinding and polishing shafting, and was an authority on production and utilization of machinery of all types. He was a member of the American Society of Mechanical Engineers since 1887.

□ □ □

Frank J. Sprague, 77, builder of the first successful electric railway line in this country and widely known in many industries for his many inventions and developments in the electrical field, at his home in New York, Oct. 25. For many years he was consulting engineer for Westinghouse Electric & Mfg. Co., General Electric Co. and Otis Elevator Co. He developed an alternating-current induction smelting furnace and pioneered many electrical innovations in elevator design and control. He was to have received the John Fritz gold medal for 1935 at the annual convention of the American Institute of Electrical Engineers next January.

### FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

| | 1934 | | 1933 | |
|---|---|---|---|---|
| | Imports | Exports | Imports | Exports |
| Jan. | 22 653 | 178,023 | 21,892 | 56,720 |
| Feb. | 25,407 | 151,184 | 19,748 | 63,936 |
| Mar. | 38,393 | 261,269 | 22,114 | 80,567 |
| April | 26,862 | 201,539 | 28,061 | 100 395 |
| May | 29,465 | 241,753 | 26,295 | 123,069 |
| June | 24,848 | 219,406 | 34,368 | 102,581 |
| July | 17,676 | 233,186 | 52,805 | 83,311 |
| Aug. | 32 418 | 242 947 | 46,839 | 119 374 |
| Sept. | 23,847 | 301,330 | 55,706 | 108,799 |
| 9 mo. | 241,579 | 2,030,637 | 307,610 | 834,203 |
| Oct. | ..... | ..... | 46,673 | 164,755 |
| Nov. | ..... | ..... | 28,979 | 157,600 |
| Dec. | ..... | ..... | 31,310 | 184,585 |
| Total | ..... | ..... | 414,790 | 1,350,692 |

### ORIGIN OF SEPTEMBER IMPORTS

Gross Tons

| | Pig iron | Manganese ore | Ferromanganese |
|---|---|---|---|
| Germany | 100 | ..... | ..... |
| Netherlands | 5,944 | ..... | ..... |
| Sweden | 50 | ..... | ..... |
| United Kingdom | 250 | ..... | 194 |
| Canada | 3,184 | ..... | 955 |
| British India | 2,762 | ..... | ..... |
| Soviet Russia in Europe | ..... | 2,463 | ..... |
| Brazil | ..... | 200 | ..... |
| Gold Coast | ..... | 1,878 | ..... |
| France | ..... | ..... | 177 |
| Italy | ..... | ..... | 66 |
| Norway | ..... | ..... | 593 |
| Total | 12,290 | 4,541 | 1,985 |

| | Sheets, skelp and sawplates | Structural steel | Steel bars | Hoops and bands |
|---|---|---|---|---|
| United Kingdom | 1 | ..... | 31 | 31 |
| Belgium | 323 | 1,590 | 1,065 | 1,070 |
| France | 8 | 156 | 4 | 12 |
| Sweden | 4 | ..... | 183 | 3 |
| Germany | ..... | 131 | 189 | 361 |
| Norway | ..... | ..... | 25 | ..... |
| Austria | ..... | ..... | 8 | ..... |
| Czechoslovakia | ..... | ..... | 2 | ..... |
| Total | 336 | 1,877 | 1,507 | 1,477 |

# September Steel Exports a Record

SEPTEMBER exports of steel and iron products at 301,330 gross tons were 58,383 tons larger than in August, a 44 per cent gain, and constitute the peak monthly total for this year or any year since the iron and steel division of the department of commerce was established in 1921, probably for any year since the period of highest shipments of the World war era. Scrap shipments in September reached the unprecedented total of 225,212 tons, 69,670 tons more than was exported in August.

Over nine months of this year iron and steel exports total 2,030,637 gross tons, which is 1,196,434 tons or 143.4 per cent greater than the corresponding nine months of 1933. Scrap brought the principal part of this growth, but important gains in exports of other steel and iron products have contributed largely also.

Steel and iron imports in September were 23,847 gross tons, a decline of 26.4 per cent from August of this year and 57.2 per cent from September, 1933. This total was smaller than for any month of this year except January and July.

In nine months of 1934 imports of steel and iron totaled 241,579 gross tons, which is 66,031 tons less than for the corresponding period of 1933, a drop of 21.50 per cent.

Principal classifications in which exports were larger in September than in August were: Scrap, 225,212 gross tons, an increase of 69,670 tons; tin plate, 6525 tons; plain shapes, 1732 tons; steel bars, 1241 tons; fabricated shapes, 1004 tons; cast iron screwed fittings, 840 tons.

### UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

(In gross tons)

| Commodity | Sept., 1934 | Aug., 1934 | 9 mo. 1934 |
|---|---|---|---|
| Pig iron | 12,290 | 18,418 | 99,091 |
| Sponge iron | 51 | 1 | 795 |
| Ferromanganese, spiegeleisen[1] | 1,985 | 1,818 | 23,411 |
| Ferrochrome[2] | ..... | 2 | 67 |
| Ferrosilicon[3] | 41 | 20 | 638 |
| Other ferroalloys[4] | ..... | ..... | 46 |
| Scrap | 1,157 | 1,025 | 30,317 |
| Steel, ingots, blooms, etc. | 333 | 290 | 1,321 |
| Concrete bars | 161 | 142 | 1,121 |
| Hollow bar, drill steel | 150 | 95 | 662 |
| Merchant steel bars | 1,507 | 1,580 | 14,259 |
| Iron slabs | ..... | ..... | 1 |
| Iron bars | 67 | 111 | 687 |
| Wire rods | 339 | 720 | 8,582 |
| Boiler and other plate | 43 | 54 | 225 |
| Sheets, skelp, saw plate | 336 | 576 | 3,475 |
| Tin plate | ..... | 11 | 117 |
| Structural shapes | 1,877 | 2,480 | 16,277 |
| Sheet piling | ..... | ..... | 1,109 |
| Rails and fastenings | 52 | 225 | 2,157 |
| Cast-iron pipe, fittings | ..... | 29 | 40 |
| Welded pipe | 86 | 39 | 1,302 |
| Other pipe | 109 | 285 | 2,265 |
| Barbed wire | 533 | 830 | 7,869 |
| Round iron, steel wire | 138 | 187 | 1,298 |
| Telegraph, telephone wire | ..... | 19 | 21 |
| Flat wire, strip steel | 178 | 245 | 1,258 |
| Wire rope, strand | 139 | 170 | 1,182 |
| Other wire | 34 | 71 | 622 |
| Hoops and bands | 1,477 | 2,323 | 13,246 |
| Nails, tacks, staples | 599 | 428 | 5,728 |
| Bolts, nuts, rivets | 8 | 19 | 194 |
| Horse and mule shoes | 30 | 10 | 308 |
| Castings and forgings | 127 | 195 | 1,188 |
| Total | 23,847 | 32,418 | 241,579 |

[1]Manganese content.
[2]Chrome content.
[3]Silicon content.
[4]Alloy content.

### UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

(In gross tons)

| Commodity | Sept., 1934 | Aug., 1934 | 9 months 1934 |
|---|---|---|---|
| Pig iron | 379 | 285 | 2,617 |
| Ferromanganese, spiegeleisen | ..... | 26 | 44 |
| Iron and steel scrap | 225,212 | 155,542 | 1,275,414 |
| Ingots, blooms, billets, slabs and sheet bars | 430 | 65 | 9,211 |
| Bars, iron | 70 | 115 | 786 |
| Bars, steel | 3,917 | 2,676 | 39,791 |
| Bars, alloy steel | 228 | 116 | 2,189 |
| Wire rods | 1,293 | 1,414 | 19,081 |
| Boiler plate | 964 | 108 | 1,769 |
| Other plate, not fabricated | 3,404 | 3,421 | 25,900 |
| Skelp, iron or steel | 1,140 | 8,770 | 60,360 |
| Iron sheets, galvanized | 99 | 103 | 1,088 |
| Steel sheets, galvanized | 6,500 | 6,398 | 49,215 |
| Steel sheets, black | 6,078 | 8,568 | 65,007 |
| Iron sheets, black | 284 | 527 | 3,536 |
| Strip steel, cold rolled | 737 | 403 | 10,650 |
| Hoop, band and scroll iron or steel | 342 | 1,437 | 11,433 |
| Tin, terne plate | 17,752 | 11,227 | 140,076 |
| Water, oil, gas and other tanks ex. lined | 183 | 394 | 4,733 |
| Shapes, not fabricated | 4,983 | 3,251 | 25,186 |
| Sheets, fabricated | 2,694 | 1,590 | 12,870 |
| Plates, fabricated | 187 | 247 | 2,036 |
| Metal lath | 86 | 83 | 865 |
| Frames, sashes and sheet piling | 88 | 146 | 1,882 |
| Rails, 50 pounds | 2,613 | 5,431 | 51,667 |
| Rails, under 50 pounds | 213 | 817 | 4,390 |
| Rail fastenings | 843 | 606 | 9,062 |
| Switches, frogs, crossings | 155 | 368 | 1,271 |
| Railroad spikes | 156 | 193 | 2,558 |
| Railroad bolts, nuts | 53 | 66 | 1,142 |
| Boiler tubes, seamless | 1,073 | 1,055 | 5,634 |
| Boiler tubes, welded | 12 | 25 | 320 |
| Casing and oil-line pipe, seamless | 2,706 | 7,366 | 39,777 |
| Casing and oil-line pipe, welded | 340 | 439 | 8,607 |
| Seamless black pipe, other than casing, etc. | 172 | 486 | 2,592 |
| Malleable iron screwed pipe fittings | 203 | 322 | 2,251 |
| Cast iron screwed pipe fittings | 1,006 | 166 | 2,155 |
| Cast iron pressure pipe and fitt'gs for | 346 | 1,931 | 7,936 |
| Cast iron soil pipe and fittings for | 211 | 172 | 1,848 |
| Welded black steel pipe | 2,070 | 1,640 | 15,548 |
| Welded black wrought iron pipe | 45 | 266 | 1,161 |
| Welded galv. steel pipe | 1,658 | 2,083 | 17,967 |
| Welded galv. wrought iron pipe | 45 | 84 | 592 |
| Riveted iron or steel pipe and fittings | 5 | 79 | 340 |
| Plain iron or steel wire | 1,576 | 1,440 | 11,688 |
| Galvanized wire | 1,661 | 2,092 | 16,989 |
| Barbed wire | 2,659 | 3,630 | 27,894 |
| Woven wire fencing | 120 | 122 | 1,005 |
| Woven wire screen cloth | 164 | 133 | 779 |
| Wire rope | 219 | 158 | 2,064 |
| Other w re and mfrs. | 444 | 323 | 3,739 |
| Wire nails | 875 | 996 | 10,253 |
| Horseshoe nails | 58 | 40 | 559 |
| Tacks | 39 | 38 | 388 |
| Other nails, staples | 241 | 409 | 2,919 |
| Bolts, mach. screws | 450 | 463 | 3,780 |
| Iron castings | 354 | 591 | 5,571 |
| Steel castings | 284 | 173 | 1,690 |
| Car wheels and axles | 779 | 1,292 | 4,409 |
| Horseshoes | 41 | 21 | 129 |
| Iron and steel forgings, n. e. s. | 391 | 419 | 3,217 |
| Total gross tons | 301,330 | 242,947 | 2,030,637 |

# EDITORIAL

## Arrogance of Union Labor Is Obstacle to Recovery

EARLY in his administration, when President Roosevelt promised that if he made mistakes he would be among the first to acknowledge them, he was applauded warmly for his frankness. Today his labor policies are on the verge of failure, yet he has refrained not only from admitting error but also from taking action which might change the outcome from failure to success.

The Rooseveltian plan for "collective bargaining," which originally was acclaimed so enthusiastically on social and ethical grounds, now has deteriorated in practice to the status of a cheap racket. The question is whether the President will recognize the futility of continuing to coddle professional union labor at the expense of recovery before the American public—its patience exhausted by the cumulative evidence of union arrogance and oppression—openly voices its disapproval of the present farce.

### Idealists, in Writing Section 7a, Overlooked Need of Providing Checks Against Union Labor

Section 7a, the interpretation of which has caused most of the trouble, was written largely by idealists at a time when they were keyed to an emotional pitch to punish industry. The sincerity of many who helped to create it is not questioned. Most of them believed it would correct unwholesome conditions ushered in by the depression. Few of them realized that their brain child would be used to collect tribute from honest business by means as reprehensible as those employed by Capone or to foment strife involving needless bloodshed and destruction.

The mistake they made was the common one of inexperienced reformers. In writing Section 7a they saw only one side of the problem. In their emotional fanaticism, the Wagners, Perkinses, Tugwells, Howes, Frankfurters, Richbergs, etc. could visualize only the horns and cloven hoofs of industry and the wings and halo of A. F. L. The pink haze of new power blinded them to the thought that professional union labor could do wrong. Consequently they spurned all warnings that NRA should provide checks against abuses by union labor.

Had they incorporated in Section 7a a provision against coercion by professional unionists, similar to that in Section 3 of the British labor disputes act as revised in 1927, few of the strikes of the past year would have occurred.

But Section 7a, imperfect as it is, could have been made to serve fairly well had President Roosevelt insisted that it be administered impartially. With the broad powers granted him by congress he could have accorded union labor the latitude required for legitimate activities and yet held it in check to prevent it from abusing its privileges. Instead he chose to coddle it, and thus he has spoiled it by kindness.

### Attitude of President Furnishes Example to Underlings To Favor Professional Unions

Every day brings new evidence of the disastrous results of this policy. No employer, no matter how upright or liberal he has been in dealing with his employes, is immune from sudden attack by union labor racketeers. The famous Kohler case, in which a handful of agitators wrecked a plant, terrorized a city and threw hundreds of loyal employes out of work is the rule, not the exception.

The bad effect of the Roosevelt policy of pandering to A. F. L. also was illustrated by the code experience of the structural steel fabricating industry. Here certain A. F. L. officials outsmarted a series of supine NRA deputies and caused them to alter the code without the consent of the industry so that it would have delivered the fabricators into the domination of union labor and could easily have paved the way for discrimination against steel made, rolled or fabricated by non-union labor. Only an eleventh-hour display of sanity by the reorganized NRA averted this miscarriage of justice.

The deplorable point in these cases is that the President's attitude of solicitude for A. F. L. is such that underlings in many branches of the government believe it is their duty to favor professional union labor on every occasion.

Many hard working government officials are embarrassed by this policy. In contacts with industry, they acknowledge the extent to which the President's example of coddling A. F. L. is hindering their efforts to hasten recovery. The American public is becoming fed up with the increasing arrogance of professional unions. Even the wiser heads in A. F. L. itself are beginning to realize that the abuses practiced by the unruly element of its membership under the encouragement of the Roosevelt policy are bad for the legitimate labor movement.

Industry should strive hard to convince the President that his policy is wrong, and that it is a constant brake upon recovery.

# THE BUSINESS TREND

## Slight Improvement Ushers in Month of November

RUNNING true to form for a pre-election month, October failed to witness any marked changes in the trend of business. Most of the indicators of industrial activity moved within a narrow range. In fact, fluctuations were so slight that several times during the month the business indexes compiled by several trustworthy authorities showed diametrically opposed trends. When all the evidence is in, it may show that activity was slightly better at the end of October than at the beginning of that month.

Steelworks operations again were pointed upward as the month ended. Prior to the end of October, the rate had not exceeded the 25 per cent mark since the middle of August. Output of electric power for the week ending Oct. 27 was 1,677,229,000 kilowatt-hours, a moderate gain over the previous week and 3.4 per cent above the output for the corresponding week of 1933. It was the third highest output in the last three years. Revenue freight car loadings for the week ending Oct. 27 may show a slight recession from those of the preceding week. This possibility is seen in the preliminary loadings figures for a number of the larger carriers. Automobile output, which ran well about 38,000 assemblies per week in September, averaged slightly under 25,000 weekly in October.

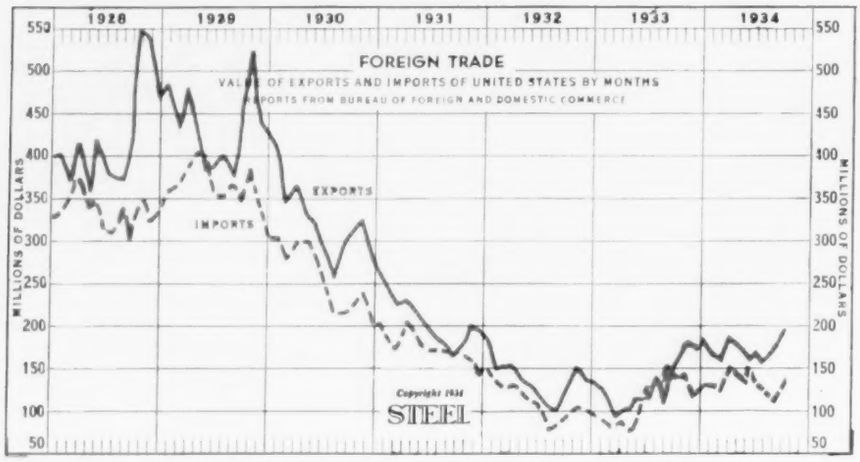
### Reduced Earnings Reflect Restricted Volume And Higher Costs of Third Quarter

Third quarter earnings, now being reported, reflect not only the restricted volume of business but also the increased costs incurred under present conditions. Earnings of 165 corporations analyzed by the National City Bank of New York were 25.5 per cent lower than in the corresponding third quarter of 1933 and 31.3 per cent below the earnings for the second quarter of 1934.

Commodity prices again are declining, although at the end of October they were approximately 15 per cent above their corresponding level a year ago. Iron and steel prices, as measured by STEEL's composite, now are only 5 per cent above corresponding 1933 levels, while finished steel prices are about 9 per cent higher.

| 1934 | |
|---|---|
| Sept. | 174,451 |
| Aug. | 244,713 |
| July | 277,690 |
| June | 321,970 |
| May | 351,813 |

| 1933 | |
|---|---|
| Sept. | 198,421 |
| Aug. | 239,904 |
| July | 236,680 |
| June | 257,613 |
| May | 224,228 |




| Exports | | Imports | |
|---|---|---|---|
| September, 1934 .... | $191,690,000 | September, 1934 .... | $131,659,000 |
| August, 1934 ..... | 171,965,000 | August, 1934 ..... | 119,515,000 |
| September, 1933 .... | 160,119,000 | September, 1933 .... | 146,643,000 |

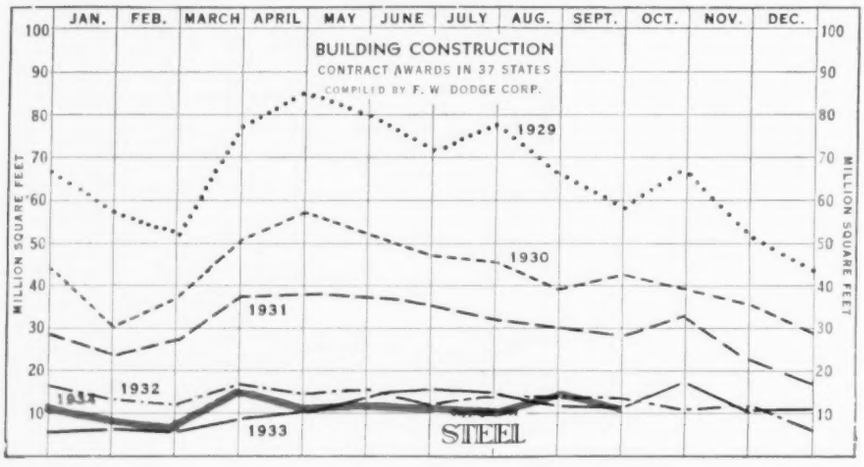
### September Exports Up Sharply Trade Balance Improves

Merchandise exports during September were higher in value than for any preceding month this year, and while imports exceeded in value the total for July and August, they were below those of any other month since last November. September exports amounted to $191,690,000 and imports $131,659,000, leaving a favorable trade balance of $60,031,000. For September, a year ago, export valuation was placed at $160,119,000 and imports $146,643,000, with a trade balance of only $13,476,000.

### Industrial Production Index Below Last Year

The index of industrial production declined during September, according to the monthly report issued by the federal reserve board. The index for the month stood at 71, a drop of 2 points from the preceding month and compares with 84 in September a year ago. The production index for manufacturers was 69 as compared with 72 in August and 83 in September, 1933. The index for steel was off one point to 37 and compares with 65 in September, a year ago.

| | |
|---|---|
| September, 1934 ..... | 71 |
| August, 1934 ..... | 73 |
| September, 1933 ..... | 84 |




| Square Feet | |
|---|---|
| September, 1934 ..... | 12,510,300 |
| August, 1934 ..... | 14,259,000 |
| September, 1933 ..... | 12,867,400 |

### September Building Trend Continues Downward

Building awards as measured in new floor space in 37 eastern states declined nearly two million square feet in September. The latest report from F. W. Dodge Corp., places awards for the ninth month at 12,510,300 square feet compared with 14,259,000 in August. In September, a year ago, awards totaled 12,867,400 square feet. Valuation of construction contracts awarded in September totaled $110,219,200, a loss of more than 8 per cent when compared with the August volume of $120,014,600.

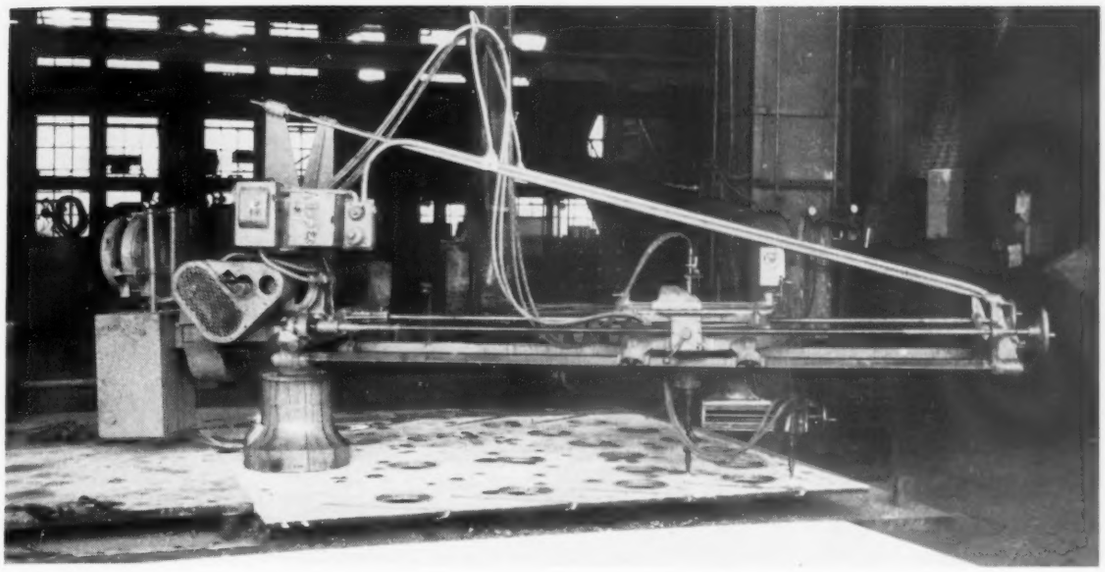


*Fig. 1—Portable, universal machine for cutting steel plate up to 8 inches thick and within a 17-foot diameter circle. Through the combined use of four feeds regular or irregular outlines of almost any conceivable shape may be cut*

# SPECIAL MACHINES BUILT FOR TORCH CUTTING IRREGULAR SECTIONS

GAS cutting is employed with unusual ingenuity by the General Electric Co., Schenectady, N. Y., in the fabrication of turbines, hydro-electric generators and many other heavy steel structures. Cutting procedure at this plant involves a combination of straight gas cutting and highly accurate flame machining and bevel cutting. Operations include cutting of sections of any desired outline, regular or irregular, and with edges straight or beveled to any desired angle. With the technique employed, it is easy for this company to form highly irregular sections, representing combinations of compound curves, so accurately that they match each other and form metal-to-metal joints.

Several gas cutting machines, either designed and built entirely by the company, or purchased from outside manufacturers and adapted for broader use than that for which the machines were originally designed, form the basis of this technique. They all are equipped with cutting tips designed and built by General Electric Co. for use in connection with oxygen and ordinary illuminating gas.

One of them, designed and built by this company in 1911, is shown in Fig. 1. This is a portable, universal machine for cutting any outline within a 17-foot-diameter circle. The speed range is suitable for cutting steel plate up to 8 inches thick. The machine consists of a cantilever arm so pivoted on a pedestal as to afford space at the short end for mounting a speed-control rheostat and a counterweight. The long end is equipped with guides, similar to those of a lathe bed, on which the carriage system—a combination of a circular carriage and a cross-feed carriage—is mounted and along which the system is moved by a motor-driven worm-type feed. The circular carriage is a rim-shaped structure which may be rotated by means of another motor-driven feed. The cross-feed carriage, which holds the torch is mounted on guides which permit it to be moved back and forth along a diameter of the circular carriage by means of a hand feed.

The driving motor is mounted on the cantilever arm directly over the pedestal. A flexible gear-and-pinion transmission system enables the operator to engage either of the two mechanical feeds previously mentioned or a third mechanical feed which moves the entire equipment mounted on the cantilever arm about the pedestal as a center.

With this arrangement, the circular-carriage feed is used for cuts up to about a 30-inch diameter, and the pedestal feed for larger circular cuts. For straight-line cuts, the lengthwise mechanical feed along the cantilever arm may be employed or, if the cut is short, the hand feed on the cross carriage may be pressed into service. Through the combined use of the four

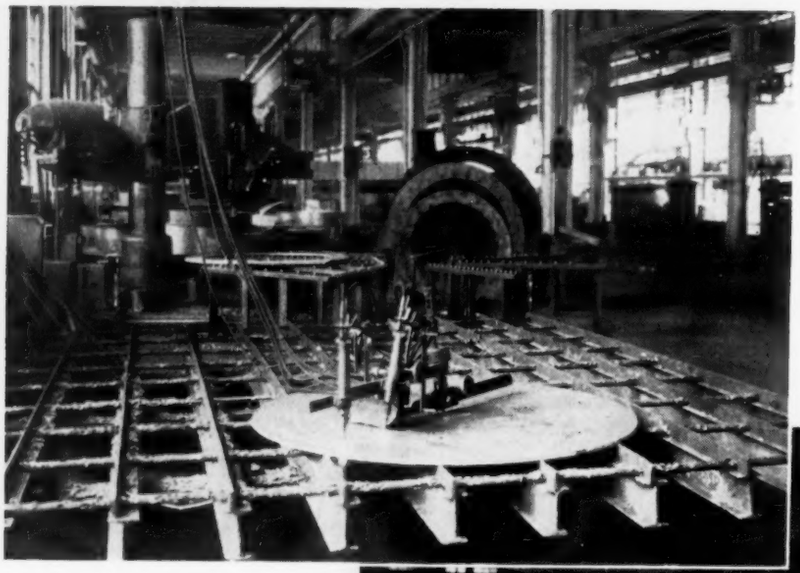


*FIG. 2 — Circle-cutting machine, fitted with adapter so that the two torches may be set at any desired angle*

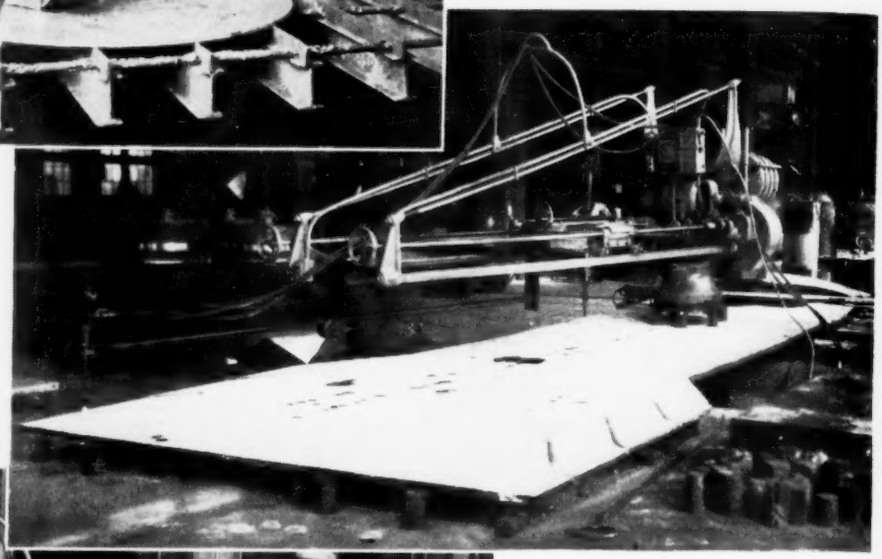


*FIG. 3—By using extension arms these portable machines are equipped for cutting circles up to 41 feet in diameter*

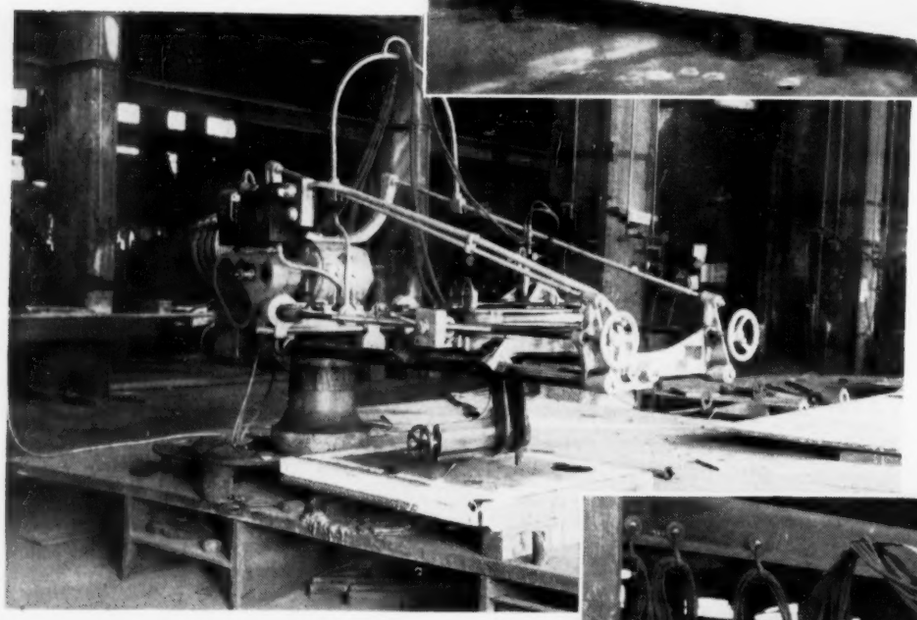


*FIG. 4—Cutting away part of the edge of a 4-inch plate so as to leave a 45-degree beveled surface*

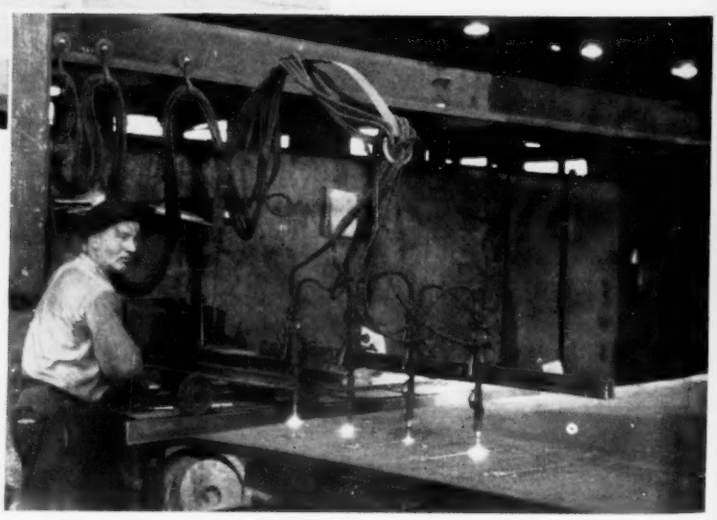


*FIG. 5—Four pieces may be cut simultaneously on a pantograph; the pieces shown are 8 x 7½ inches and 1¼ inches thick*

feeds, regular or irregular outlines of almost every conceivable shape may be cut. The simpler outlines are cut almost automatically with the three mechanical feeds. The more complex ones, on the other hand, require a certain amount of skill in synchronizing the hand-operated cross-carriage feed with one or all of the three mechanical feeds.

The torch is mounted on the cross carriage in such a way as to permit its being tilted at whatever angle may be desired for making beveled edges. In some cases, if the outline affords the opportunity, two torches may be mounted on the machine and two cuts made simultaneously.

Fig. 3 shows the same type of machine equipped with an extension arm which enables it to cut regular or irregular outlines within a circle of 41-foot diameter.

### Edges May Be Beveled

An example of flame machining, as done with these machines, is shown in Fig. 4. This illustration shows how the machine is set for removing part of the edge of a 4-inch plate so as to leave a 45 degree beveled surface. Cuts of this kind are made with such uniformity that the resulting surfaces are practically as smooth as rough-finished machined surfaces and show no flame-mark. The same machine may be used for cutting a beveled edge of irregular outline. This machine also has a radial reach which enables it to cut anything within a circle of 17-foot diameter.

The portable machine shown in Fig. 2 is used entirely for cutting circles. It is fitted with an adapter so that the torches may be set at any desired angle. It is capable of cutting circles up to 40-foot diameters, the radius being varied by using interchangeable center bars. The illustration shows two torches cutting simultaneously, the one on the outside cutting vertically and that on the inside cutting a beveled edge.

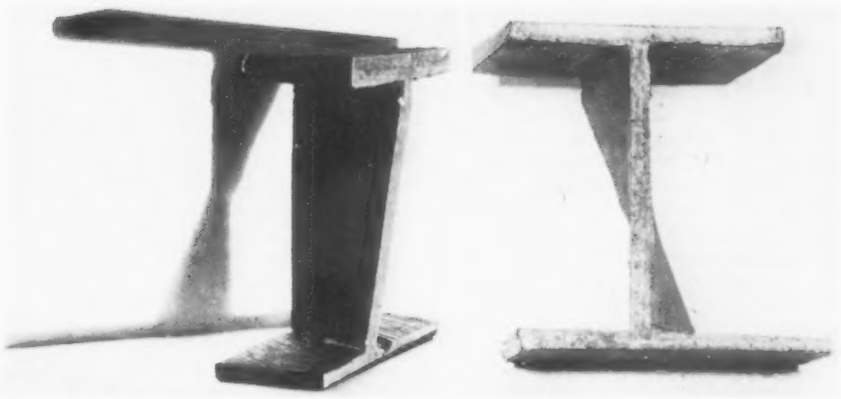


*Fig. 6—Two views of a difficult and complicated machine part; aside from the drilling of 4 lead holes, the entire piece was gas cut out of a steel bar section 8½ inches square*

Fig. 7 shows how two of these machines have been mounted on a lathe bed, thus providing them with a fifth feed—a long, straight-line one. These machines can be employed for cutting various shapes, both regular and irregular, but are particularly useful in cutting relatively long slabs having parallel edges. With this equipment, in fact, slabs up to 25 feet long and 5 feet wide may be cut.

Fig. 6 shows two views of a difficult and complicated machine part which is produced with ease on these machines. The piece, when finished, resembles a section of H-column with the web at right angles to the top and bottom flanges on one side but at an angle of about 30 degrees on the other side. There are two other irregularities in this part; one flange is wider than the other, and one is longer than the other. The whole piece is cut out of a section of steel bar about 8½ inches square, after which four lead-holes are drilled in the block where the sides of the web sections are to join the flange. The piece then is cut out, the hand cross-feed being employed for rough cutting the flange sections and a mechanical feed being used for cutting out the irregular web section. In cutting the web section a cam, in this case nothing more than a length of straight steel bar, is employed. This cam is set at an angle to the center line of the work and as the torch is fed through the cut, the cam causes the axis of the torch to change gradually, and thus cut a section the shape of which is suggestive of that resulting from a torsion test.

Recently another interesting machine part was cut with the aid of this equipment. Looking like a short, heavy, curved bar of trapezoidal cross-section, it was obtained by making cuts on two radii, 3 inches apart. The inner cut was made at an angle of 30 degrees to the vertical from the top outward and the outer cut at an angle of 45 degrees from

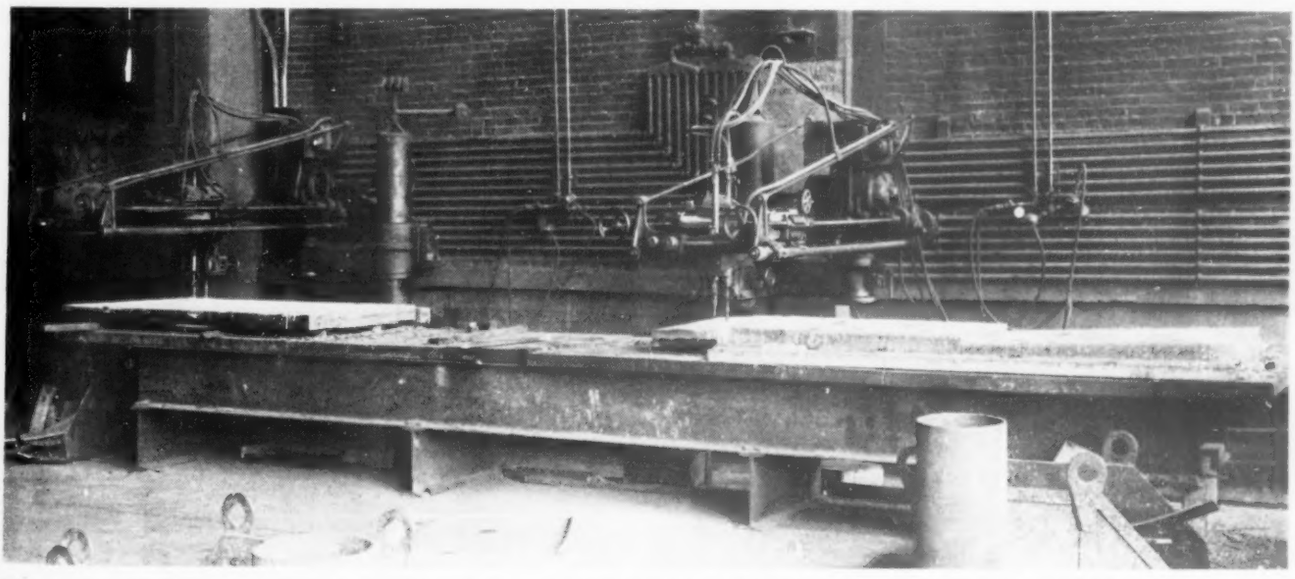


*Fig. 7—Two portable gas cutting machines mounted on a lathe bed, thus providing them with a fifth feed—a long straight-line one*

the top inward. The ends were cut at right angles to the top and bottom. As is usual, the cuts were started with lead-holes drilled by radial drills mounted in a universal head.

Another interesting part recently made with this equipment and somewhat similar to the one just mentioned was cut along two radii 2 inches apart at the top and only ½-inch apart at the bottom. This piece was cut out of 5-inch steel plate and was 5 inches long, with straight ends at right angles to the top and bottom. This was a particularly exacting job in view of the fact that the bottom edges—although only ½-inch apart—had to be straight and true. Formerly, before the technique of gas cutting this part was developed, the part was drilled, chipped out by hand, and filed smooth.

Fig. 5 shows a pantograph equipment with four cutting torches, designed and built by the General Electric Co. for use with oxygen and illuminating gas. This apparatus cuts from one to four pieces simultaneously, depending on size, from one inexpensive wooden template.

The illustration shows the apparatus engaged in cutting wedge-shaped blocks, four at a time, 8 x 7½ inches and 1¼ inches thick.

# Report on Properties of Strip Steel, Effect of Pressure on Aging Rates

RESULTS of initial tests with steel to determine directional properties in hot, cold-rolled and annealed low-carbon strip were outlined by Arthur Phillips, professor of metallurgy, Yale university, New Haven, Conn., and H. H. Dunkle, graduate student of the same department, in a paper presented before the American Society for Metals at the National Metal congress in New York, Oct. 1-5.

Hot and cold-rolled strip containing 0.09 per cent carbon, 0.40 per cent manganese, 0.008 per cent phosphorus and 0.028 per cent sulphur was used. Cupping and mechanical tests also were made on strip annealed at four temperatures, 680 to 745 degrees Cent. and on pieces cut at 0, 22.5, 45, 67.5 and 90 degrees to the rolling direction. On cold-rolled material tests were made of specimens with reduction of 40, 50, 60 and 69 per cent, the result of cold rolling. In material given heavy reductions before annealing, a maximum in tensile strength and a minimum in elongation values were found at about 45 degrees to the rolling direction.

### Study Cold-Reduction Effects

Height of the ears on drawn cups increased with the degree of cold rolling, the strip rolled 40 per cent forming ears 45 degrees from the rolling direction. From strips rolled 50, 60 and 69 per cent the ears were located in all cases from 0 to 90 degree positions. Reasonably uniform series of hot strip, differing only in thickness for the investigation of cold-reduction effects and subsequent annealing were used.

On unannealed cold-rolled strip the transverse strength was 10 to 12 per cent greater than the longitudinal. Tests on annealed material showed the type of fiber induced by cold rolling persisted after annealing. The anneals following the 50 and 60 per cent reductions tended to shift the maximum tensile strength value from the 90 to 67.5 and 45 degree directions. In the case of the anneals subsequent to the 69 per cent reduction, however, there was a decided maximum at the 45-degree position. The elongation values, on the other hand, for the 69 per cent reduction reached a minimum value in the neighborhood of the 45-degree direction.

### Pressures Slow Aging

Effect of high hydrostatic pressures, 12,000 atmospheres, on six age-hardenable alloys merely decreased the rate of aging of five of the alloys, the exception being iron-nitrogen, according to studies by Leland R. Van Wert, lecturer on metallurgy, Harvard university, Cambridge, Mass. A pressure of 20,000 atmospheres failed to lower the aging rate of iron-nitrogen. Alloys used in the study were commercial duralumin, aluminum-copper alloy, essentially duralumin composition, but with 0.17 per cent calcium as an aging inhibitor; an aluminum alloy with approximately 1 per cent silicon, 0.6 per cent magnesium and 0.5 per cent iron; a complex aluminum alloy with approximately 10 per cent zinc, 1 per cent copper, 0.7 per cent iron, 0.8 per cent silicon, 0.75 per cent manganese and 0.4 per cent magnesium; lead-calcium alloy, 0.04 per cent calcium; and iron-nitrogen alloy, containing 0.07 per cent nitrogen.

Each alloy was solution-annealed at the proper temperature for the time necessary to insure complete solution of the precipitant. It was then quenched in water and hardness taken immediately. The alloy was permitted to age at room temperature, one series under high pressures, generally 12,000 atmospheres, and another series at ordinary pressures. Mr. Van Wert's tests indicated the final hardness was not affected by pressure, only the time necessary to attain this hardness. Alloys initially, but partially, aged under high pressures showed no anomalies when the aging was concluded under normal pressures.

Results also indicated the greatest effect of pressures is experienced by the alloys of greatest compressibility. Also according to Mr. Van Wert, it would apparently appear effects of pressure on the aging rate come about through changes in the viscosity of the metastable solid solution, influencing the diffusion rate of the age-hardenable elements through the latter's lattice.

### Aging Effect in Steel

Further application of thermomagnetic analysis as an aid in metallographic research was covered in a paper by G. A. Ellinger, assistant metallurgist, and R. L. Sanford, physicist, national bureau of standards, Washington. Results of prolonged tempering at 100 degrees Cent. and aging at room temperature of 0.8 per cent carbon steel were noted. Changes taking place within hardened steel during aging are of small magnitude and difficult to determine by usual methods. Use of thermomagnetic analysis to show the effect on hardened steel of prolonged low-temperature tempering and of aging for long periods, makes for the conclusion, on the part of investigators, that retained austenite in hardened steel is not affected by tempering, but decreases materially in amount upon aging.

A second conclusion drawn is that martensite is apparently unstable, but tends toward stability with the application of heat or upon aging with stabilization accelerated by liquid air cooling after quenching. Tests made by the investigators also indicate tempering causes no change in the rate of cementite formation while aging apparently greatly increases the time of cementite formation.

Tests were made of 11 cylindrical specimens, 10 centimeters long and 5 in diameter. Range of tempering was from 1500 hours at 100 degrees Cent. to 168 hours at the same temperature and aging up to two years in room temperature. In discussion, Prof. C. Nusbaum, Case School of Applied Science, Cleveland, suggested that the investigation might have included the relative condition of the samples used in the tests, this not being fully clear. He also took the view that the problem offered an opportunity for study by X-ray.

# The WISE CHOICE!

## • • • *in the specification of pipe*

What kind of service will it give when installed and how long will it last, are the two main points the wise buyer considers in his choice of pipe. To give the ultimate in performance, pipe must be clean and smooth, inside and outside; that is, it must be free from mill-scale. Such scale causes corrosion and contributes to deterioration in the pipe line. NATIONAL Scale Free Pipe, therefore, is a wise choice. It is made by a special Scale Free Process, applied to butt-weld sizes ½ to 3-inch. Here are the outstanding advantages of this clean, smooth pipe—

**Minimized corrosion—particularly pitting—Clean, smooth surfaces, inside and outside—Full delivery capacity—less friction loss—No damage to valve seats; no clogging of small orifices—Greater strength at the weld.**

When you order standard pipe for any purpose, be sure to specify NATIONAL Scale Free and secure the maximum in performance and economy. Large use by discriminating buyers, continued through many years, has made it—*America's Standard Wrought Pipe.*

CHROMATE TREATMENT—*All National Galvanized Pipe is given a special chromate treatment to resist discoloration and the formation of white rust. This patented process preserves that smooth, glistening surface or metallic lustre which is characteristic of good galvanizing.*

NATIONAL TUBE COMPANY • Pittsburgh, Pa.

Subsidiary of United States Steel Corporation

*Pacific Coast Distributors* • COLUMBIA STEEL CO. • San Francisco, Calif.

# NATIONAL SCALE FREE PIPE
## SPELLERIZED

# A.S.M. Grain Size Symposium Records Recent Progress

**STEEL herewith presents the third and concluding installment of its report on the grain size symposium conducted by the American Society for Metals during its annual convention in New York, Oct. 1-5. The first installment appeared in the issue of Oct. 22; the second in the issue of Oct. 29.**

GRAIN size is only one of several important variables in sheets for deep drawing purposes, and it alone does not determine drawing performance, stated R. L. Kenyon, supervising research engineer, American Rolling Mill Co., Middletown, O., in presenting a paper on the importance of grain size of sheet steel for deep drawing. Differences between grain size of box-annealed and normalized sheets have a profound influence on the drawing quality as well as the surface of the finished part. Over this range, the finer grained material is somewhat harder, but is more ductile and produces a much smoother surface after severe deformation.

Commercial normalized sheets, said Mr. Kenyon, today show a variation in grain size over a range which is much narrower than that indicated in his paper. To a large extent, this range is determined by the experience of sheet manufacturers in producing sheets to meet specific jobs. The design of dies and drawing shop practice enter into the problem and, although certain users find a given type of sheet best suited to their need, it does not mean that another type cannot be made to do the same job. An example of a difficulty in deep drawing is shown in Fig. 6.

### Held Within Close Limits

Sheet manufacturers recognize the importance of controlling the grain size of sheets for deep drawing and are able to regulate this within limits that are closer than the differences that can be observed in the performance of the material. Recrystallization during annealing after cold working is responsible for the grain refinement in cold-rolled strip and also for the coarsening of the grains in some deep drawn parts that are subsequently annealed in the critical temperature range. The latter difficulty can best be overcome by normalizing.

Experience in producing steel sheets for deep drawing, concluded Mr. Kenyon, has shown that physical test data together with a knowledge of the grain size are satisfactory indications of drawing quality and a control of these properties makes it possible to produce material that meets the requirements of present deep drawing practice.

G. R. Brophy, research laboratory, General Electric Co., Schenectady, N. Y., pointed out that Mr. Kenyon dealt with the ideal situation; however, it seemed to him that there is one limitation placed upon the manufacturer of deep drawing steel which will keep him far short of the ideal. That is the nature of the material itself. This steel is of the so-called rimming type, which of necessity varies in its nature from the surface to the center of the ingot. This natural difference carries through to the finished sheet and as a result sheets are found usually with dual structures.

### Vary from Surface to Center

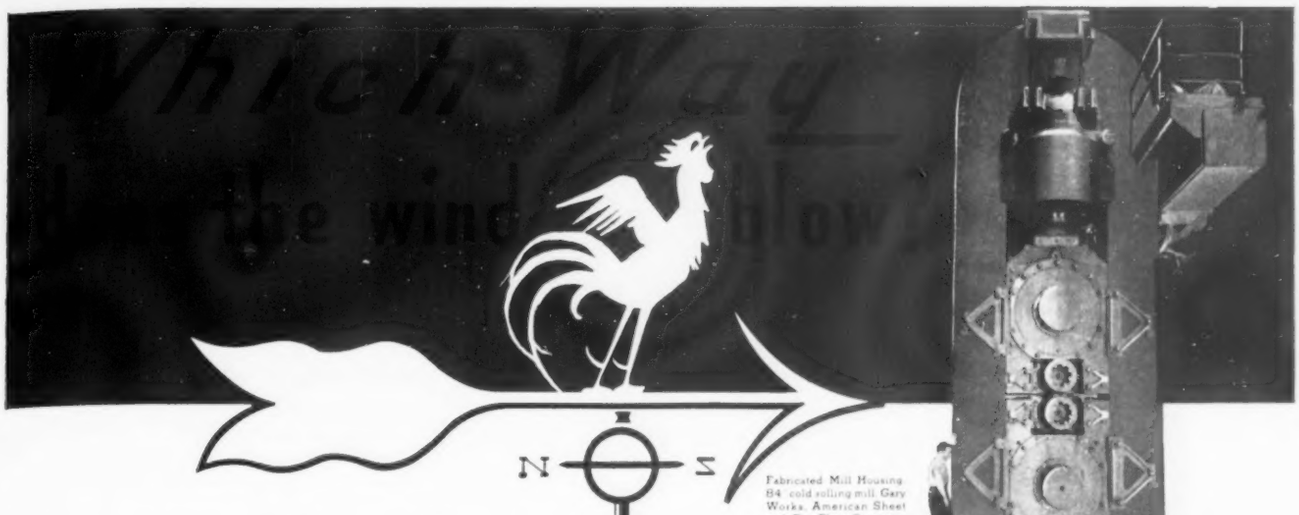
The surface material of any sheet is inherently coarse grained, continued Mr. Brophy, while the core is inherently fine grained. Those sheets, or portions of sheets, which are reduced wholly from rim material will be naturally coarse grained. As a result, the response to mechanical and especially thermal treatments will vary accordingly. The speaker illustrated his point by showing photomicrographs of two sheets of automobile body steel from the same sheet bar analyzing 0.03 per cent carbon and 0.28 per cent manganese. They were given the same mechanical treatment and then annealed at the same time at 740 degrees Cent.; the resulting structure varied. After a normalizing treatment from 930 degrees Cent., a similar variation occurred. Stating that the hardness and drawability of these materials varied beyond the working range for this class of steel, Mr. Brophy asked how is it possible for the manufacturer to so closely control his grain size.

PRESENTING a paper on the influence of grain size on magnetic properties, W. E. Ruder, research laboratory, General Electric Co., Schenectady, N. Y., concluded that hysteresis does depend upon grain size, but to a much lesser extent than upon a number of other factors, such as purity, heat treatment, mechanical treatment, and shape of sample tested. Hysteresis also bears a distinct relation to orientation, which in turn has an important bearing upon the rolling direction effects observed in polycrystalline sheets and strips.

T. D. Yensen, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., pointed out that in addition to grain size, the hysteresis loss depends upon the impurities in the material, chiefly C, $O_2$, S and P. To obtain a correct idea of the effect of grain size, it is essential to eliminate the effect of impurities, or to keep them very low; otherwise the effect may entirely mask the effects of grain size.

Considering thin sheets or strips, Mr. Yensen stated it has been apparent for some time that the case is not so simple as in bulky sam-

*Fig. 6—Roughened surface of sharp corner on an automobile hub cap. Illustration used by R. L. Kenyon to show that when certain portions of a deep-drawn part must undergo large local elongation, a rough surface may develop if the material is coarse grained. This condition may be remedied in many cases by grinding, filing or hand polishing, but in instances such as this, these operations would be difficult if not impracticable. In any event, this would be an item of added cost*




In buying equipment, we follow the course we helped to chart, and rolled steel construction is used in place of castings wherever practical. We are only one of many users of machinery who find in Rolled Steel Construction greater strength and less weight at lower cost. This explains the marked trend in design toward the use of rolled steel in the construction of all types of machinery.

Rolled steel is a thoroughly worked material of known strength and physical properties. Among the hundreds of shapes we roll you will find many which are particularly applicable to machine construction. The Carnegie Shape Book should be on the desk of every designer of machinery. Let us send you a copy.

Fabricated Mill Housing, 84" cold rolling mill, Gary Works, American Sheet and Tin Plate Company, Gary, Indiana.

Fabricated Gear Case, No. 8 mill, Elwood Works, National Tube Company, Elwood City, Penna.

Fabricated Slab Deseaming Planer, Gary Works, Illinois Steel Company, Gary, Indiana.

Fabricated Hot Cinder Car, Carrie Furnaces, Carnegie Steel Company, Rankin, Pennsylvania.

Fabricated Annealing Pots, Cuyahoga Works, American Steel & Wire Company, Cleveland, O.

CARNEGIE STEEL

ples, that some other factor besides size enters the picture. The high hysteresis loss obtained in ring samples made from thin sheets or in strip samples from ordinary sheet material could not always be accounted for on the basis of impurities and grain size alone. As soon as we were able to produce a strip or sheet material with grains predominantly oriented with the cube edge parallel to the magnetizing force, we obtained a hysteresis loss comparable to that obtained in bulky samples of similar composition.

In Mr. Yensen's opinion, Mr. Ruder has done much to help clear up this situation by presenting quantitative results in regard to the effect of orientation on the hysteresis loss. Stating that Mr. Ruder's statement that "hysteresis does depend upon grain size, but to a much lesser extent than upon a number of other factors" undoubtedly was true, but it would be much better to confine the statement to one fundamental cause, namely, lattice distortion, because grain size, which means grain boundaries, impurities, mechanical and thermal treatment, all seem to have one fundamental effect in common—to distort the crystal lattice. As we begin to think of magnetic properties in terms of lattice structure, it would seem logical to relate these properties whenever possible to the lattice structure.

### Rolling Technique Has Effect

N. P. Goss, Cold Metal Process Co., Youngstown, O., contended Mr. Ruder's work should stimulate further research on the various factors which influence magnetic properties. Mr. Ruder pointed out that the factors of purity and heat treatment usually are recognized, but the manner in which the specimen was prepared (mechanical) and size of specimens have been given little consideration. Mr. Goss added that the magnetic properties of ferromagnetic alloys depend upon the manner in which the hot rolling, cold rolling and heat treating are distributed during processing.

Work done by Mr. Goss shows that the watt losses can be reduced to a very small value when material is processed by proper distribution of hot rolling, cold rolling and heat treatment. Another factor of great importance and usually not considered at all is the perfection of crystallinity.

At present, continued Mr. Goss, most authorities believe that the hysteresis in large grain iron specimens is smaller than in corresponding fine grain specimens. After an exhaustive survey, Mr. Ruder comes to the conclusion that the hysteresis loss does depend upon the grain size (microscopic) to some degree but that other factors are of greater importance. From his own work, Mr. Goss has found that the hysteresis loss becomes smaller as the grain size decreases, provided the final product has single crystal characteristics, therefore, these results are again in agreement with Mr. Ruder's.

Admitting that the work of Mr. Ruder does not seem to warrant a definite connection between grain size and magnetic properties, R. S. Dean, chief engineer, metallurgical division, national bureau of standards, Washington, stated that work at the bureau on mineral powders has led to such definite and clear-cut relationships of this kind that there is hope that such relations do exist for steel—however, a revision of the ideas on grain size may be required.

### Coercive Force a Measure

From work already done at the bureau, Mr. Dean said there is reason to believe that coercive force is a definite measure of what may be termed "internal surface" which may result from grain boundaries as ordinarily described, precipitated phases, glide planes, or other discontinuities. The coercive force in steel may then be a measure of grain interface if a grain is defined as a continuous "homogeneous volume of metal lattice." It is suggested that such homogeneous volumes are the determining factor in potential grain size after hardening and some experiments are under way to test this suggestion.

Emphasizing the importance of purity in magnetic samples, N. A. Ziegler, power use research department, West Penn Electric Co., Pittsburgh, declared it is clear that a difference of even a few thousandths of 1 per cent of carbon and oxygen has a profound effect on the magnetic properties of unalloyed iron. Carbon has a similar effect on the magnetic properties of silicon alloys.

A variation as small as a few thousandths of 1 per cent carbon may easily be introduced in a magnetic sample by the heat treatments, and, for this reason, continued Mr. Ziegler, it is felt that unless a complete chemical analysis of every magnetic sample, after its magnetic testing is completed, is given, its history is incomplete. This is particularly true about carbon which must be determined in every magnetic sample individually with an accuracy of at least plus or minus 0.001 per cent.

FACTORS determining the impact resistance of hardened carbon steels were considered in a paper presented by Howard Scott, research laboratories, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Recognizing the possibility of greater significance attaching to impact tests on hard steels than on soft, the author made impact tests on a variety of fully hardened carbon steels of medium carbon contents, using a Charpy type specimen with a special notch. No pronounced maximum in impact resistance at low tempering temperatures was disclosed by this test. Complete solution of ferrite was found to be essential, however, for full development of impact resistance.

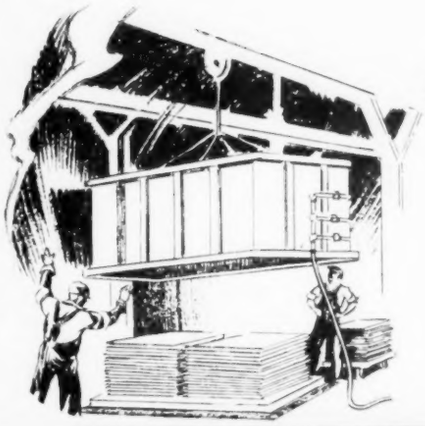
Comparing various compositions as quenched from 830 degrees Cent. and tempered at 300 degrees Cent., the author reported that nearly all impact values corrected for hardness differences fell within one of two widely separated groups. Laboratory melts deoxidized with manganese and silicon alone fell in the low impact group as did one commercial steel. Certain additions of aluminum and vanadium brought the impact values consistently in the high group. Aluminum treated steels had a fine austenitic grain size and gave high impact values at hardness values up to 600 Vickers at least, while coarse-grained steels lost impact resistance above 400 Vickers. Observations on highly purified steels indictate that greater need for additions which restrain grain growth will accompany advances in this direction.

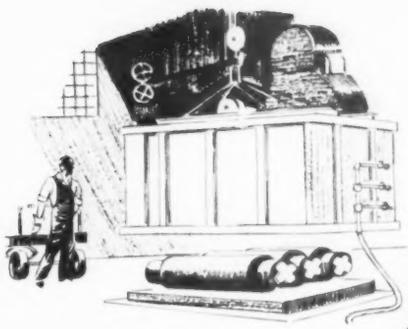
A PAPER dealing with the improved machinability and durability obtained in automobile tranmission gears by so carrying out the process of forging that the forging is subjected to the greatest possible amount of work or compression, also the effect of McQuaid-Ehn grain size on the development of greater density in forgings, was contributed by W. E. Sanders, formerly metallurgical engineer, Buick Motor Co., Flint, Mich., and now associated with the Delco Products division, General Motors Corp., Dayton, O.

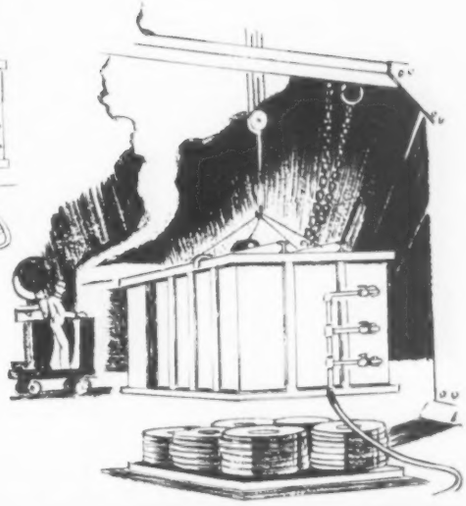
Density, as termed in the paper, is the elimination of the spongy appearance on the surface of a piece when cut in two, polished and deep etched. By its elimination, tests were shown evaluating the difference in machinability; also, durability is improved by the reduction in gear tooth growth and distortion when hardened, which makes for better alignment and tooth surface contact. By virtue of the better alignment and denser material, pitting and granulations are eliminated, giving greater efficiency and longer life. Mr. Sander's conclusions were as follows:

"In this development it has been found possible to produce denser forgings (see Fig. 7), in which slipping and tearing of the fibers are minimized by employing a steel of a specified grain size and structure, accurate forging temperatures, and specially designed dies for controlling the flash to insure greater compression of the forging.

"It is recognized, however, that in carburizing steels, where the carbon is usually low, the inherent grain size







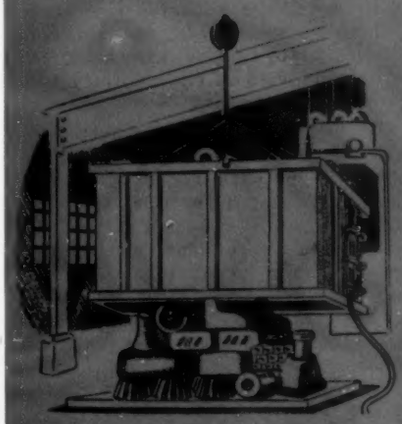
The

SC

# RADIANT TUBE

## ANNEALING COVER

# HAS MANY USES



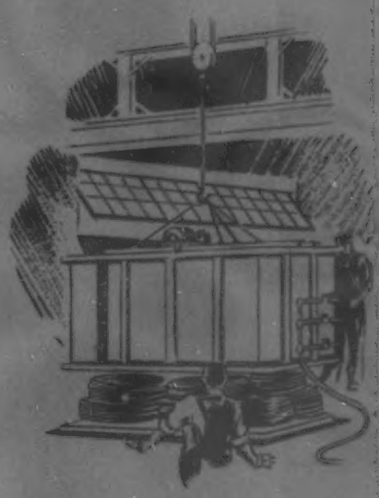
The SC Radiant Tube Annealing Cover is applicable to almost any annealing job. Whether you anneal castings, sheets, wire coils, strip coils, rolls or various other sizes or shapes, this annealing cover will give you excellent results—with *economy* and *convenience*.

In addition to flexibility, the SC Radiant Tube Annealing Cover provides many other advantages. It eliminates the use of heavy boxes and bases. It reduces fuel consumption and annealing time because there is no dead weight to heat. It permits positive control of temperature from top to bottom of work, by the use of the horizontal heating elements.

SC Diffusion type of firing assures uniform temperature throughout the length of the heating elements, which *operate under negative pressure*.

Let our engineers give you additional information.

SC Radiant Tube Annealing Covers can be furnished in standard sizes, in either circular or rectangular types.



# Surface Combustion Corporation

TOLEDO, OHIO

Sales and Engineering Service in Principal Cities

is not so important and should not be coarser than a No. 5 for good case refinement with the use of ordinary treatment.

"With the evidence at hand, of the effect of mechanical working being concentrated at the grain boundaries, it is hard to avoid the conclusion that the manner of hot working the steel has something to do with the density of the material at the grain boundaries. To carry the speculation further, the forging of large-grained structures would be preferabe because they would contain fewer grain boundaries along which density changes could take place. This interpretation would merely be transferring the same thought from the notion of a uniform change in density throughout the structure to a concentrated change in density occurring only in the region of the crystal boundaries.

"With this in mind, the object of a properly controlled forging process would be to cause as little disruption as possible of the more or less stable material at the grain boundaries."

**Prefers Fine Grained Steel**

F. G. Sefing, Michigan State college, East Lansing, Mich., in a written discussion, drew attention to Mr. Sanders' statement that the impact test bars broken across the fibers are superior when fine-grained and when broken parallel to the fibers the coarse-grained shows superiority. Mr. Sefing said that although gear forgings may well be made with coarse grained steels, the common run of forgings require fine grained steel—about No. 6 McQuaid-Ehn—in order that the longitudinal test bars show maximum toughness. It is obvious, therefore, that the author's specifications cannot be applied at present to the latter class of forgings.

Writing further, Mr. Sefing also pointed to the author's reference to a uniform compression of the steel during the forging operation, which results in a more dense structure and obviously more uniform properties of the forging. This may be an easy matter in the class of forging considered by the author, but in the shaping of larger pieces and particularly forgings of varying thicknesses the desirable dense and uniform steel would be a remarkable feat at any temperature in any forge shop. Mr. Sefing maintained that uniformity of metal structure and of physical properties of the common forgings therefore are a difficult accomplishment in modern shop practice.

## Poor Light Causes Accident Every 46 Seconds

Improper use of artificial light caused an occupational accident every 46 seconds and a fatal accident every hour in America last year according to D. W. Atwater, Westinghouse Lamp Co., and general secretary of the Illuminating Engineering society. Of the 1,269,500 occupational accidents (persons gainfully employed at time of accident) recorded for the entire United States last year, 15 per cent were traceable to poor lighting, based on statistics of the National Safety council.

Employers in the entire nation paid a total of $550,000,000 for all occupational accidents in 1933, of which $420,000,000 represented wage losses, $40,000,000 the medical expense, and $90,000,000 the insurance costs. About $200,000,000 of this total sum could have been saved through the use of correct lighting, according to estimates made by Mr. Atwater.

Lighting can be the chief provocation of occupational accidents. If the light source is inadequate or produces blinding glare, it induces eye strain that causes a worker to misjudge and err. Workers must see well if they are to work safely.

The better light, better sight nation-wide activity in which the country's eye specialists are co-operating this year, is directed to the goal of educating everyone in the correct use of artificial light. In this manner will human eyes be aided to see better and thus bring safer working conditions. STEEL's contribution to this movement was a series of three articles on the subject of good industrial illumination—what it is and how it may be obtained. These appeared in issues of Aug. 13, Aug. 20 and Sept. 17.

## Cuts Grinding Time on Medium Sized Castings

Medium sized castings always have been "time eaters" while being trimmed, says the Sullivan Machinery Co., 400 North Michigan avenue, Chicago, in announcing a new casting grip which is designed to speed up this operation. It consists of a base plate with optional legs. It has an adjustable backstop and an air operated jaw. It firmly clamps castings of almost any shape within a size range of 2 to 20 inches. It opens instantaneously to release the piece but closes slowly to safeguard the operator's fingers.

To provide protection to surfaces of the softer metals, the jaw and dog may be faced with wood. The working arrangement entails that the grinding and chipping tools be brought to the casting just as they are in the case of large castings. Large, high-speed swing grinders can be used on the work because the pieces can heat up without slowing production.

## Cupola Refractories Sizes

Printed copies of simplified practice recommendation R154-34 covering cupola refractories now are available from the United States government printing office, Washington, at 5 cents each. This recommendation became effective March 15, 1934, and covers the sizes of cupola, tap-out and slag hole blocks. The recommendation now is being followed generally in the cupola refractories industry.

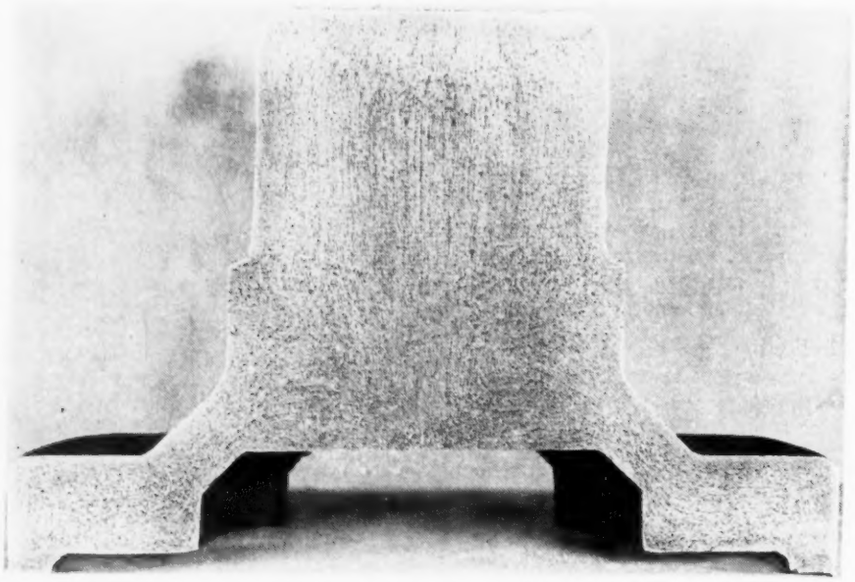
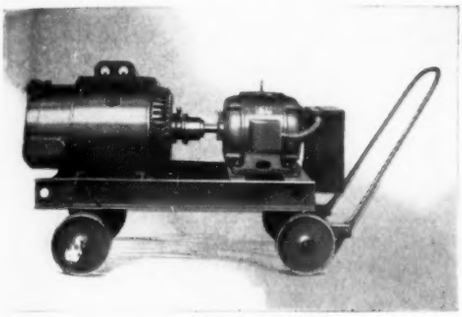


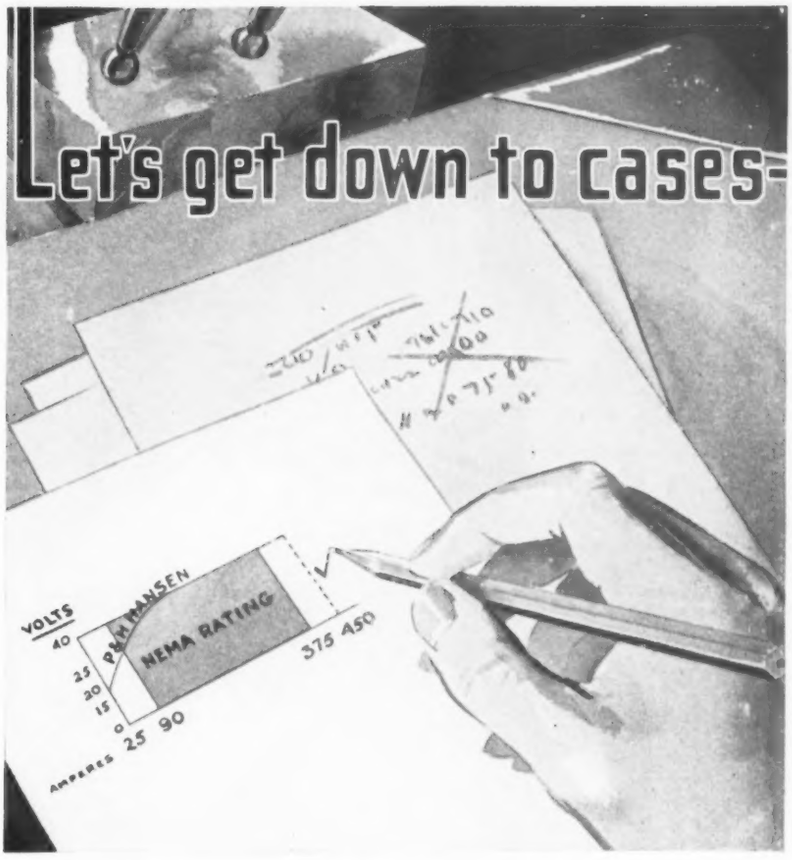
*Fig. 7—Structure of a deep etched forging which had good machining qualities. Example shown by W. E. Sanders. At the beginning of the research, forgings were being made without any temperature control, as low as 1800 degrees to a maximum of 2000 degrees Fahr. Temperatures were at once increased to 2050 to 2150 degrees. Improvement in machinability and structure was noted with this increase in temperature, producing structures comparable to the one shown here. With the evidence at hand on coarse grain and the results of high-temperature diffusion, forging temperatures for production were subsequently raised to between 2200 and 2300 degrees Fahr.*

300 AMPERE PORTABLE



400 AMPERE PORTABLE

600 AMPERE STATIONARY




## On this matter of welding range:

N. E. M. A. standards for a three hundred Amp. welder require a range at 40 volts of from 90 to 375 Amperes.

Now look at the way P&H-Hansen beats these standards: The 300 Amp. P&H Welder will make high quality welds at an amperage as low as 25 and from there all the way up to a high of 450. And it will do this without any auxiliary devices.

This means that a P&H-Hansen is a consistent performer on a wide range of jobs. You can use it on light sheets or heavy plates . . . on repair work or steady, day-in-day-out production on heavy plates.

And you'll find that the P&H-Hansen is fast. Current adjustment is simple — just one micrometer screw. Its arc is steady . . . its penetration uniform. No separate stabilizer. No external exciter. Find out *all* about the P&H-Hansen line. A word from you will bring our new 24-page bulletin: "Weld It Well".

**HARNISCHFEGER CORPORATION**

*Established 1884*

4411 W. NATIONAL AVENUE MILWAUKEE, WIS.

# P&H-HANSEN ARC WELDERS

BACKED BY 50 YEARS OF EXPERIENCE

# Reviews Operation and Maintenance Of Nickel Plating Baths

ALL nickel baths are of the same general type, that is, nearly neutral or slightly acid solutions, in which the nickel is in the form of nickel sulphate, according to the August issue of the *Monthly Bulletin* published by United States Research Corp., 40-35 Twenty-first street, Long Island City, N. Y.

Concentration of the nickel sulphate varies from 10 ounces per gallon to 34 ounces per gallon. As a general rule, the ammonium chloride varies from 2 to 4 ounces per gallon and the boric acid about the same.

Nickel solutions are neutral or on the acid side. The hydrogen ion concentration of such a solution is 5.5 to 6.0. There are some baths which plate nickel at a much lower hydrogen ion concentration, but such baths are for a specific purpose and are never used for general plating work. Such a bath gives better deposits provided the current density is relatively high.

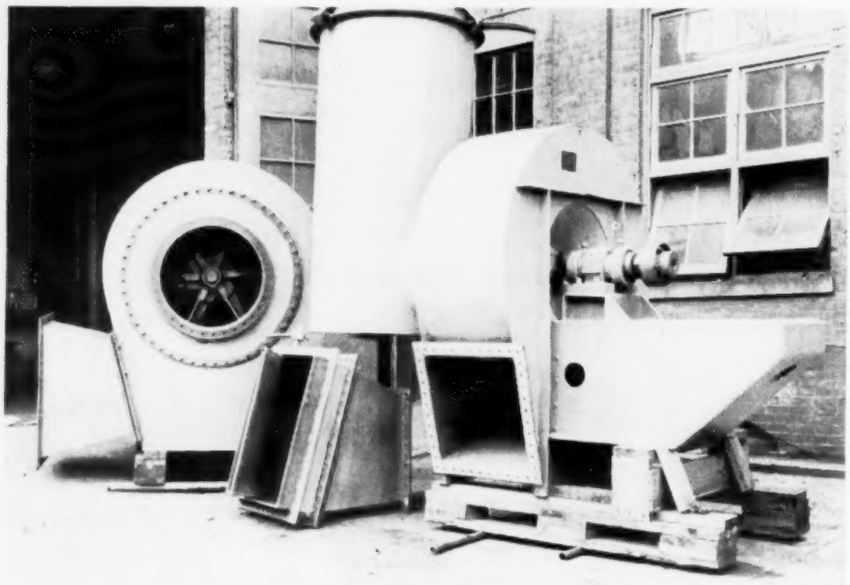
Quite often the sulphates of ammonium, sodium, potassium, magnesium, etc., are added to nickel baths, the reasons for these additions being two-fold: First, the salts increase the conductivity of the solution; and, second, they decrease the metal ion concentration, both of which are desirable.

When pure nickel is made the anode in nickel sulphate solution, there is a tendency for the nickel to become more noble, that is, it does not pass into the solution as readily as it should. Under these conditions, oxygen is given off at the anode, the metal ion decreases, and the solution becomes more acid. The results are poor deposits. Ammonium chloride will overcome this fault to a certain extent. Other salts which partially correct this are: Sodium chloride, nickel chloride and magnesium chloride.

Great care should be taken with the nickel which is used as anodes in nickel plating baths. As already stated, this metal has a tendency not to dissolve, especially if certain impurities are present. Another difficulty encountered with nickel is the tendency for irregular corrosion. Some parts of the metal will dissolve, while other parts will flake off and cause rough deposits. Some of the facts which influence the solubility of the anodes are: (1) Carbon content; (2) iron content; (3) the structure of the metal. Cast nickel anodes, if pure and annealed properly, should give little trouble with uniform corrosion and passivity.

### Buffer May Be Added

Acid often is liberated at the anode, especially if the anode efficiency is low. Some means should be provided to keep the hydrogen ion concentration value constant, or nearly so. If a salt of a weak acid is present, the liberation of sulphuric acid frees a corresponding amount of weak acid which is very slightly dissociated, and the value of the hydro-

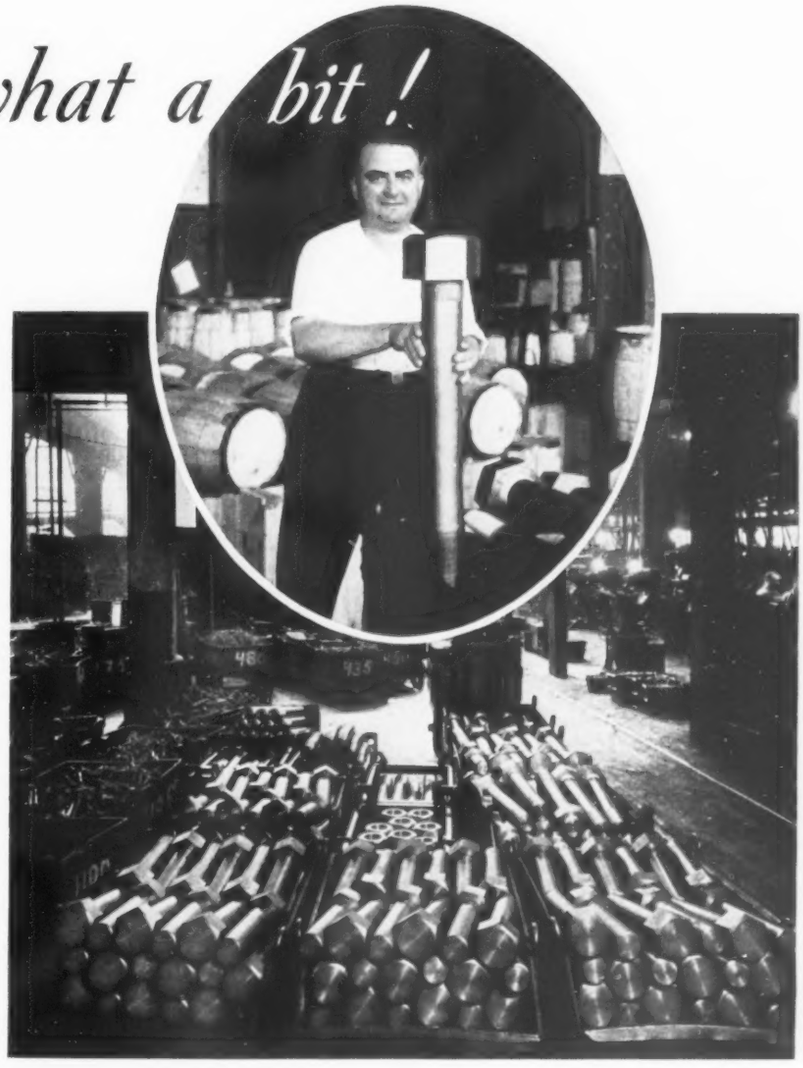


*ACID-PROOF RUBBER COVERING APPLIED TO LARGE EXHAUST FAN UNITS: By a new process of placing rubber on metal, the rubber holds so tenaciously after vulcanizing that it cannot be removed from the metal without tearing and destroying it. This photograph shows exhaust fans provided with an acid-proof rubber coating by the Manhattan Rubber Mfg. division, Passaic, N. J., of Raybestos-Manhattan Inc.*

UPSON

# DOES ITS BIT FOR *Boulder Dam*

## *. . . and what a bit!*



Upson has just completed an order that is of more than ordinary interest—an order for special bolts, nuts and studs to be used at Boulder Dam in connection with emergency gates and needle valves for canyon wall outlets and for butterfly valves in the power plant.

These items vary in size from tiny pieces weighing one-seventh of an ounce to huge studs and bolts that are as much as a man can lift. Many are made of ENDURO, Republic's Perfected Stainless Steel, while others are SAE 2340 alloy steel, heat treated.

The specifications were the most exacting that Upson had ever followed. Every single piece, and there were hundreds of them, had to be perfect to satisfy the engineers who inspected before shipment. They were vital parts of a vital project that must serve for many years.

For standard and special headed and threaded products, you can feel safe in specifying Upson, because the same care in the selection of materials, the same skilled workmen, and the same plant facilities that produced this order are employed in the making of all products carrying this well known name.

UPSON NUT DIVISION
REPUBLIC STEEL
CORPORATION
CLEVELAND, OHIO

● *Bolts and nuts in all standard and special shapes, sizes, alloys and finishes. Standard and special rivets of all kinds. Wire rope clips. Turnbuckles. Automotive and railroad special items. Headed and threaded products for every use. Your specialties are our specialty.*

gen ion concentration changes very little. Such compounds are called buffers, and are essential for nickel solutions. One of the best buffers for nickel solutions is boric acid, which is used most of the time.

Care and control of nickel plating solutions are important. Solutions can be analyzed by using the control system of the United States Research Corp. These sets are available for nickel, copper (acid and cyanide), cadmium, silver, brass and black nickel. Each, or all, is contained in a compact cabinet which contains all the apparatus and chemicals needed to analyze these solutions. The operation of this control system is extremely simple, and requires no technical or chemical training. The results are said to be positive and quickly obtained.

S S S

## Special Alloy Steel Bolts Resist Shearing Stress

A company manufacturing a track-moving appliance required a steel which in the form of two bolts or studs would withstand a maximum shearing stress of 30 tons without bending or breaking. Of a number of alloy steels tried out, only one succeeded in meeting the requirement; none of the others was capable of withstanding more than 20 tons pressure. The successful steel has the composition: Carbon 0.5 per cent; silicon 2 per cent; manganese 1 per cent; molybdenum 1.25 per cent; and vanadium 0.4 per cent.

S S S

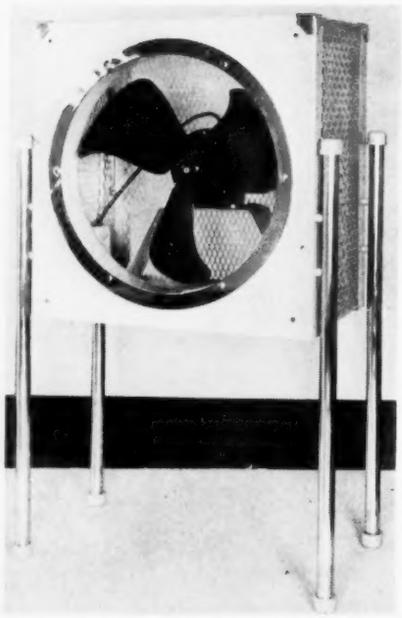
## Precautions To Be Used In Welding Copper

A welding expert states that while copper ordinarily cannot be welded in any other than the flat position, either with the carbon arc or metallic arc, it can be welded successfully on an incline of not greater than 30 degrees in which case the welding should proceed up the incline. In any case, while welding copper, it is necessary to preheat the work either with a gas torch when using a metallic arc or by using a long arc and moving back and forth over a short section of the seam before welding. The welding must be done rapidly so that the metal will not have a chance to cool.

S S S

## Structural Steel Sprayed

A public utility company in 1933 metal sprayed about 100 tons of structural steel. This was a departure from its previous practice of galvanizing. In addition, it metal sprayed a large quantity of bolts, nuts, washers and other small structural steel members.



*Fan and motor mounted in special cage which may be set at any desired height. The unit weighs 85 pounds and is designed for residence ventilation*

# Air Circulator Has Cage of Steel

A CONSIDERABLE quantity of steel in the aggregate is being consumed by the General Electric Co., Schenectady, N. Y., in fabricating air circulators designed to exhaust heated air from residences and replace it with cool air from outdoors. The air circulator itself consists essentially of a motor and an aluminum fan. It is in the support that steel is used.

The fan is set in a cage 24 inches square and 15 inches from front to back. The motor rests on a support or base made of steel plate ⅛-inch thick and 4½ inches wide ond bent so that the circulating unit is supported in the center of the cage. This support in turn rests on 1 x 1-inch steel angles which are welded in the bottom of the cage. The cage itself is made by bending strip steel into 1 x 2-inch angles which are welded together at the corners. The space between them is filled in with expanded steel lath welded to the angles.

The front of the cage is made of sheet steel with an opening 18½ inches in diameter, slightly larger than the diameter of the fan. Inside this opening is a sheet steel collar so shaped as to guide the flow of air uniformly through the opening. The front of the cage is decorated with chromium plated orifice ring and corner fittings. The sheets and expanded steel surfaces are covered with gray laquer. The legs on which the cage is supported are formed from 1-inch black pipe 35 inches long, with caps screwed on both end. These legs are bolted to the cage and are adjustable so that the cage may be set at any desired height. The weight of the unit is 85 pounds of which more than half is comprised of the steel in the cage.

S S S

## Records Transmitted to Distant Receivers

Transmission of temperature, pressure, liquid level or motion records over distances of 250 miles or more with accuracy and freedom from circuit disturbances is made possible by the development of a new recording instrument by the Bristol Co., Waterbury, Conn. The recorder operates on the chrono-flo system and requires a transmitter, a recording receiver, a relay and rectifier box at the receiver and a 2-wire line connecting the transmitter and receiver. Alternating current at both receiver and transmitter is required, but neither synchronization nor the same frequency are necessary. Using a 12-inch chart, the recording receiver is housed in a moisture-proof rectangular steel case.

S S S

## Beryllium Copper Used for Non-Sparking Tools

While non-sparking small tools have long been in use, the Stanley Works, New Britain, Conn., at its Stanley Rule & Level plant, is producing chisels, hammers, screwdrivers, clay picks, railroad picks, sledge hammers, pry bars, deek floor and hand scrapers in wrought beryllium copper. These tools are nonmagnetic and tests prove them to be almost as lasting as steel. Such tools are especially adaptable for use in oil refineries, lacquer, cellulose, nitrate and other plants where fire and explosive hazards are a problem.

S S S

## Knurled Heads Popular

A manufacturer of socket head cap screws recently began producing these screws with knurled heads. This change has resulted in increased business. "We have as yet to meet a mechanic who doesn't jump at the knurled socket head cap screw as soon as he lays eyes on it because it is human nature to drive screws home with the fingers as far as it is humanly possible to do so before resorting to any kind of mechanical wrench," says the manufacturer, the Standard Pressed Steel Co., Jenkintown, Pa.

S S S

## Dies Are Flame Hardened

A Michigan manufacturer of automotive stampings up to recently obtained an average output of 500

(*Please turn to Page* 59)

# CONVENTION

experience, will put you in touch with the latest developments of the industry.

### Your Great Opportunity

The 1934 I.A.A. Convention offers a rare opportunity for you to lay up a reserve of new ideas and practical methods. Bring your problems for discussion to the convention. The discussions will enable you to check your methods against those of experts.

Determine now that you will be among those present at this great convention. Write to the Secretary today for an advance copy of the program and tickets for the industrial drama, "Profits of Progress." It will be an investment for your business and professional future that you cannot afford to miss!

— *See* —

"PROFITS OF PROGRESS"

*An industrial drama featuring the 1935 profit opportunities of the Prosperity Process*

DAVIS THEATRE

Wednesday, November 14, 1934

8:15 P. M.

PITTSBURGH, PA.

***INTERNATIONAL***
***Acetylene Association***

*ESTABLISHED 1898 · 30 E. 42nd St., NEW YORK*

Program of

# International Acetylene Association

**Wednesday, Nov. 14**

9:00 A. M.—William Penn Hotel

Registration.

10:00 A. M.—William Penn Hotel

Address of Welcome, by Hon. John P. Fisher, former Governor of Pennsylvania, and now president, Pittsburgh Chamber of Commerce.
President's Address, by H. B. Pearson, Compressed Industrial Gases Inc., Chicago, and president, International Acetylene association.
Presentation of Morehead Medal.
Oxyacetylene Committee report, by G. O. Carter, consulting engineer, Linde Air Products Co., New York.

2:00 P. M.—William Penn Hotel

*Oxyacetylene Cutting with Particular Reference to Steel Mill Applications*

"Welding and Cutting in the Making and Marking of Steel," by T. R. Moxey, general master mechanic, Wheeling Steel Corp., Steubenville, O.
"Oxyacetylene Flame Cutting of Wing Type Billets," by L. Gerald Firth, president, and L. B. Knox, superintendent of melting department, Firth-Sterling Steel Co., McKeesport, Pa.
"Hard Surfacing in the Steel Mills," by E. E. LeVan, Haynes Stellite Co., Kokomo, Ind.
Discussion.

8:15 P. M.—Davis Theater

*Profits of Progress*

(An Industrial Drama in Four Acts)
By Wilfred P. Burglund

(In Approximate Order of Appearance)

Marie (A Maid) ..... Miss Alice Riley
Margaret Flint (Wife of Sales Manager—Walton Engine Works) ..... Miss Harriet Hall
Janet Claire (Secretary to President) ..... Miss Betty Renner
James Flint (General Sales Manager) ..... W. S. Farr
Robert Douglas (Asst. Design Engineer) ..... J. W. McKernon
J. Malcolm Robinson (President) ..... T. M. Hamer
Walter Lord (Wealthy Detroit Automobile Manufacturer) ..... E. C. Turner
Harry Page (Asst. Design Engineer—Walton Engine Works ..... S. C. Clark
George Tobin (Chief Engineer) ..... John J. Crowe
Alfred Parker (Plant Supt.) ..... G. O. Carter
Newell Hoyt (District Manager—Keystone Welding Equipment Co.) ..... T. C. Fetherston
John Baird (Service Engineer—Keystone Welding Equipment Co.) ..... H. H. Moss
William Dean (A Welder) ..... Peter Smith
Joseph Kaiser (A Welder) ..... Paul Jones
Jack Hubbard (A Welder) ..... Gerald Brown
An Office Boy ..... Robert Keene
A Bookkeeper ..... Harry Hobson

ACT ONE

*Scene I*—Living Room of the Flint Apartment

*An evening in May*

*Scene II*—Office of the President, Walton Engine Works

*The next morning*

ACT TWO

*Scene I*—Office of the President

*Following afternoon*

*Scene II*—Office of the Plant Superintendent

*Two days later*

ACT THREE

*Scene I*—A section of the shop, Walton Engine Works

*Two weeks later*

*Scene II*—Interior of the Davis Theater, Pittsburgh, during the showing of a current news-reel

*Three days later*

ACT FOUR

Living Room of the Flint Apartment

*Four months later*

*William Penn hotel, William Penn place, Pittsburgh, headquarters for the International Acetylene association*

**Thursday, Nov. 15**

10:00 A. M.—William Penn Hotel

*Metallurgical Aspects of the Oxyacetylene Process*

"The Advantages of the Flame-Cut Surfaces for Welding," by C. W. Obert, Union Carbide & Carbon Research Laboratories Inc., New York.
"A Comparative Study of Cutting Methods as Applied to Structural Steel," by Prof. J. H. Zimmerman, Massachusetts Institute of Technology, Cambridge, Mass.
"The Metallurgy of Welding," by J. H. Critchett, vice president, Union Carbide & Carbon Research Laboratories Inc., New York.
Discussion.

2:00 P. M.—William Penn Hotel

*Pipe Welding and Testing*

"Welds for High-Tensile Strength," by John J. Crowe, chief research engineer, Air Reduction Co. Inc., New York.
"Dependability of Commercial Methods of Testing Welds," by James W. Owens, director, National Weld Testing bureau, and consulting engineer, Pittsburgh Testing Laboratory, Pittsburgh.
"Production Methods Used on Welding for Construction Purposes," by G. E. Deatherage, general superintendent of construction, Carbide & Carbon Chemicals Corp., Whiting, Ind., and J. B. Latterner, chief, planning department, Carbide & Carbon Chemicals Corp., S. Charleston, W. Va.
"Pipe Welding," by John Zink, vice president and chairman of welding committee, Heating, Piping & Air Conditioning Contractors National association, New York.
Discussion.

**Friday, Nov. 16**

10:00 A. M.—William Penn Hotel

*Transportation*

"Construction of Transportation Vehicles by Welding," by

G. O. Hoglund, supervisor of welding, Aluminum Co. of America, New Kensington, Pa.
"Maintenance of Railroad Rolling Stock," by D. C. Reid, general superintendent of motive power, Boston & Maine railroad, Boston.
"Track Welding," by George W. O'Rourke, district engineer, Illinois Central railroad, Chicago.
"Oxyacetylene Process in Railway Maintenance of Way Work," by C. H. R. Howe, cost engineer, Chesapeake & Ohio railroad, Richmond, Va.
Discussion.

**Friday, Nov. 16**

2:00 P. M.—WILLIAM PENN HOTEL

*Education and Safety in Welding*

"What the Young Engineer Should Know About Welding," by Dean R. L. Spencer, school of engineering, University of Delaware, Newark, Del.
"How Common Safe Practice Reduces Unnecessary Hazards in the Application of Oxyacetylene Welding," by W. Dean Keefer, chief engineer, industrial division, National Safety council, Chicago.
"Safe Practices in Oxyacetylene Welding and Cutting," by E. F. Blank, director of safety and welfare, Jones & Laughlin Steel Corp., and vice chairman, A. S. S. E. engineering section, National Safety council, Pittsburgh.
"Prevention of Fires Resulting from Use of Oxyacetylene Process," by W. K. Estep, chief engineer, Allegheny division, Middle Department Rating association, Pittsburgh.
Discussion.

5:00 P. M.—WILLIAM PENN HOTEL

*General Business Session*

Report of the Consulting Engineer, by J. I. Banash, consulting engineer, International Acetylene association, president, National Safety council, Chicago.
Report of the Secretary, by H. F. Reinhard, New York.
Report of the Treasurer, by W. E. Cotter, New York.
Report of the Auditing Committee, by M. M. Smith, New York.
Report of the Legislative and Insurance Committee, and of the Technical and Engineering Committee, by H. S. Smith, New York.
Report of the Membership Committee, by Henry Booth, New York.
Report of Resolutions Committee and Nominating Committee, by L. E. Ogden, New York.
Election of Officers.

7:00 P. M.—WILLIAM PENN HOTEL

Annual Dinner (informal; ladies invited).

# Morehead Medal for 1933 Is Awarded Robert Allen Witherspoon

ROBERT ALLEN WITHERSPOON who was awarded the Morehead medal for 1933 for his contribution to the advancement of the industry or the art of producing or utilizing calcium carbide or its derivatives, was born in Rochester, N. Y., Oct. 31, 1876. He was educated in the Rochester public schools, high school and the University of Rochester; from the latter institution he received the degree of Bachelor of Arts in 1897. The same year he was employed by the Ampere Electric Chemical Co., Ampere, N. J., in experimental electric furnace work; from these laboratories came the process of melting calcined bauxite in the electric furnace, the product known in trade circles as "Alundum" and now manufactured by the Norton Co., Worcester, Mass. Later he was employed by Stone & Webster to demonstrate on a commercial scale the above process at Rumford Falls, Me.

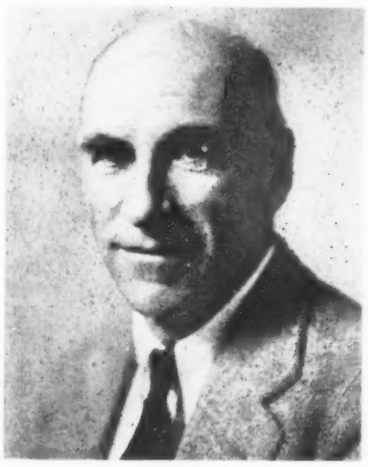
### Other Processes Developed

In 1900, Mr. Witherspoon was transferred to Niagara Falls, N. Y., where the work of the Ampere company was continued on a larger scale resulting in the development of processes for the manufacture of barium salts, cyanides, alloys and other electric furnace processes.

When the Ampere company ceased to operate Mr. Witherspoon with F. M. Becket and L. E. Saunders launched the Niagara Research Laboratories.

In 1904 he became associated with the Shawinigan Carbide Co. as superintendent of its carbide works at Shawinigan Falls, Quebec, and later with the Canadian Carbide Co. as vice president. Upon consolidation of the Canadian Carbide Co. and the Canadian Electric Product Co. in 1928 into Shawinigan Chemicals Ltd. Mr. Witherspoon was appointed vice president and general manager, which position he now occupies.

The crude carbide furnace of the 1904 era was brought up to its present high state of efficiency, as far as Canadian practice is concerned, as a result of Mr. Witherspoon's work.



**R. A. Witherspoon**
Awarded Morehead medal for 1933

During the World war it was essential for the Allies to secure enormous quantities of acetone. Prior to 1914 all acetone was produced by the wood distillation process but the output fell far short of demand. Considerable research was conducted by Shawinigan Chemicals Ltd., and as a result it was decided that the most practical method of producing acetone in vast quantities was to manufacture acetic acid synthetically from acetylene and then produce the acetone from the acetic acid. Mr. Witherspoon was responsible for the commercial development of this process. Since then, he has been instrumental in devising other processes in the manufacture of synthetic chemicals of which acetylene is the base.

### Cost Is Lowered

After cessation of the World war there was no commercial demand for the large quantities of acetone the Shawinigan Chemical Co. was capable of producing; the cost of production of acetic acid, from which acetone was made, was so high as to make it impossible to market the acetic acid in peace times. Mr. Witherspoon devoted his energies to lowering the cost of synthetic acetic acid and as a result he is responsible for the largest glacial acetic acid plan in the world, a plant consuming 3000 to 4000 tons of calcium carbide per month.

Mr. Witherspoon was president of the Electrochemical society in 1932-33 and chairman, Montreal section of the Society of Chemical Industry in 1933-34. He is a member of the University club, Montreal; Chemists' club, New York; Senneville golf club; St. Maurice Fish and Game club; and Montreal club.

---

The transportation of calcium carbide overseas was fraught with difficulty until the International Acetylene association in connection with the United States steamboat inspection service devised regulations covering this important phase of transportation, and carbide now can be shipped to all parts of the world under reasonable restrictions. Indeed carbide now is known to be one of the safest commodities to transport or store.

# You can Get every and Cutting

LINDE OXYGEN
. . . plants and warehouses in all industrial centers.
PREST-O-LITE ACETYLENE
. . . the standard for well over a quarter of a century.
OXWELD APPARATUS AND SUPPLIES
. . . available for every oxy-acetylene welding and cutting operation.
UNION CARBIDE
. . . sold in the familiar Blue and Grey drum from over 250 warehouse stocks.

"BUSINESS began to increase—rapidly. Production was lagging behind sales. Orders were being lost because of late deliveries. Production had to be doubled in just two weeks.

"The Linde organization was called in to help install a new welding department and assist in organizing welding operations. Linde engineers worked day and night supervising the training of 125 new welders. In two weeks' time the new welders were doubling production! Thousands of dollars in orders were saved!"

This manufacturer's experience is but one of many instances of how Linde Process Service continuously translates proved methods into terms of actual plant requirements and saves money for Linde users. It indicates why countless manufacturers buy everything for oxwelding and cutting from Linde.

The nearest Linde District Office will be glad to help you capitalize on this experience and to illustrate with actual examples from your own industry how Linde Process Service might help you.

**THE LINDE AIR PRODUCTS COMPANY**

*Unit of Union Carbide and Carbon Corporation*

UCC

IN CANADA, DOMINION OXYGEN CO., LTD., TORONTO

*Sales Offices:*

| | | |
|---|---|---|
| Atlanta | El Paso | Phoenix |
| Baltimore | Houston | Pittsburgh |
| Birmingham | Indianapolis | Portland, Ore. |
| Boston | Kansas City | St. Louis |
| Buffalo | Los Angeles | Salt Lake City |
| Butte | Memphis | San Francisco |
| Chicago | Milwaukee | Seattle |
| Cleveland | Minneapolis | Spokane |
| Dallas | New Orleans | Tulsa |
| Denver | New York | |
| Detroit | Philadelphia | |

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES • UNION CARBIDE

# with Haynes Stellite Steel Industry

money. You are also urged to write for a copy of a new 96-page book, "Hard-Facing With Haynes Stellite Products", which describes in more detail the applications illustrated on these pages and explains how to apply hard-facing materials. This booklet can be obtained without obligation from Haynes Stellite Sales Offices located in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, San Francisco and Tulsa, or from the General Office and Works at Kokomo, Ind., or Foreign Sales Department, New York City. Haynes Stellite welding rods and information on other Haynes Stellite Products also are available through the 42 apparatus shipping points of The Linde Air Products Company.

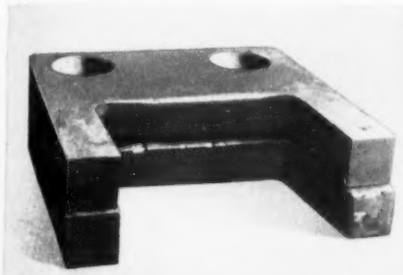
HAYNES STELLITE COMPANY

*Unit of Union Carbide and Carbon Corporation*

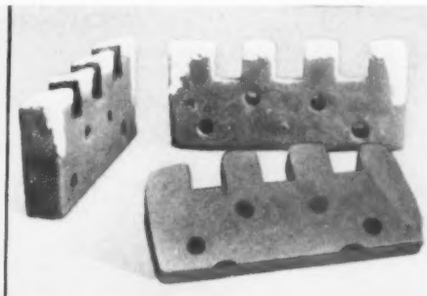
UCC

HAYNES STELLITE TRADE MARK

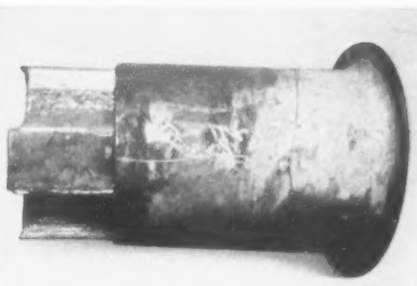
*A red-hard, wear-resisting alloy of Cobalt, Chromium and Tungsten*



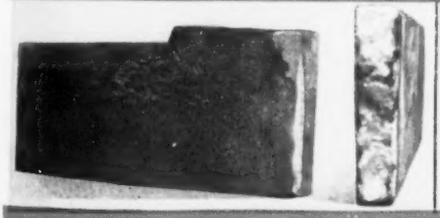
***Shear Blades.*** At a steel mill, the Haynes Stellited flying shear knife (lower) sheared 50 heats of 4-in. red-hot alloy steel billets and was easily reconditioned with more Haynes Stellite. The ordinary steel knife (upper) was good for only 6 heats.



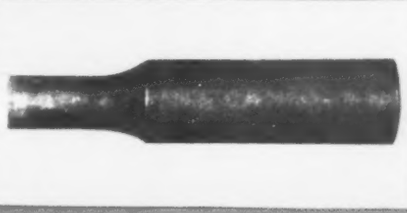
***Carbon-Scrapers.*** At a Detroit coke oven, Haynes Stellited carbon scrapers last 16 weeks whereas prior to hard-facing, these scrapers wore out in one week. As a further saving, machine steel is used as a base metal instead of high speed steel.



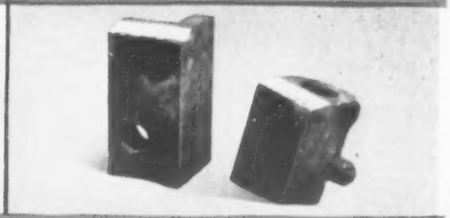
***Spindles.*** Haynes Stelliting this spindle for a 24-in. mill at a steel plant resulted in tripling its life. In addition to longer life, considerable savings in gears is realized with hard-faced spindles because the lash in the boxes is stopped.



***Spike Machine Gripes.*** A Pennsylvania manufacturing company obtained excellent results by Haynes Stelliting this gripe. The hard-faced gripe turned out 800 kegs of railroad spikes whereas unfaced gripes were good for only 80 kegs.



***Punches.*** This Haynes Stellited punch is still as good as new after hot punching 1634 holes in 1-in. thick 0.50 per cent carbon steel plate at an Indiana steel plant. Ordinary punches, formerly used, lasted on an average of only 800 holes.



***Knockout Blocks.*** Knockout blocks used on a 4-roll board drop hammer at a Michigan gear company used to last but 2 weeks. After 7 weeks' continuous service, these Haynes Stellited blocks were examined and showed practically no signs of wear.

# Many Problems Are Solved By Acetylene Association

BY A. CRESSY MORRISON

CALCIUM carbide and its derivative acetylene were discovered in Spray, N. C., in 1892. Early attempts to utilize acetylene as an addition to city gas and as an illuminant, especially in country homes and country institutions, soon led to the development of methods of generating acetylene from calcium carbide. Great excitement as to the possibilities of this illuminant led to the manufacture of some 67 devices, most of them crude. The attempted sale not only of the devices themselves but of exclusive territory for which agents representing a single device were given the sole right of sale led to conflicting interests and extravagant expectations. The insurance authorities soon took jurisdiction refusing to permit of the use of many of these devices which they considered dangerous in insured property. The confusion which existed led to the necessity of some form of associated effort. The leading manufactures of generators with the cooperation of the carbide interests, in 1898 formed the International Acetylene association.

**THE author, A. Cressy Morrison, for more than 25 years was secretary of the International Acetylene association and was the recipient of the Morehead medal in 1930.**

### Gas Gains Recognition

The work of the association at this time was connected exclusively with processes of lighting, which included bicycle lamps—a then important item. Shortly, through the efforts of the association and the cooperative spirit of the better manufacturers, rules and regulations were drawn up for the manufacture and installation of generators, with the result that acetylene became recognized as a "common illuminant" and the sale of generators and calcium carbide grew rapidly.

By 1906, the relations of the acetylene industry with the Underwriters' Laboratories had become completely cooperative and the early drastic rules and regulations had become sufficiently modified so that the use of acetylene for lighting became even more widespread.

The wide use of acetylene compressed in small tanks for lighting on automoblies spread with the growth of that industry, and was for a time used exclusively. A new field for the use of acetylene became apparent in 1906 and 1907, and rapidly developed. This was the lighting of mines. A miner's cap lamp had been devised; then it became the work of the International Acetylene association to overcome the predjuce against acetylene and carbide, to meet legislative and competitive efforts of the manufacturers of rival illuminants and secure the free use of acetylene to the miners. The struggle lasted several years with the result that a majority of the mines are lighted by what is known as the carbide lamp.

In 1907, the oxyacetylene welding and cutting torch came into use. Under the then existing regulations of the Underwriters' Laboratories which only covered methods of illumination chiefly of country homes, and also State and municipal laws and ordinances designed originally to cover other substances, the larger and entirely unexpected use of acetylene, the storage of carbide and the use of larger volumes of compressed acetylene, in any form was forbidden or commercially impossible. Large cities and towns then offered the greatest field for the use of the process of cutting and welding. Here the International Acetylene association found its most difficult task. A convention was called in Chicago to which was invited all acetylenists, all manufacturers of torches, the makers of oxygen (then an extremely small business), and those who anticipated the manufacture of blow torches and materials to be used in the new industry. At the time this meeting was called there were perhaps not more than 200 torches in the United States. The Underwriters' Laboratories sent their experts to this meeting and in three days session, rules and regulations governing an industry yet to be born were formulated and were a source of congratulation for all those who participated. This work was so well done that these rules are with a few amendments extant today.

**H. B. Pearson**
President, International Acetylene association

Fortified in this manner, the association undertook the development of model ordinances, and after nearly three years' work succeeded in having adopted in the City of New York an ordinance sufficiently liberal to permit the commercial development and the use of apparatus in the City of New York and to also properly safeguard the public from accident. This model ordinance was, by patient effort, finally adopted by our largest cities and is the basis on which the industry now rests.

### Ordinances Are Adopted

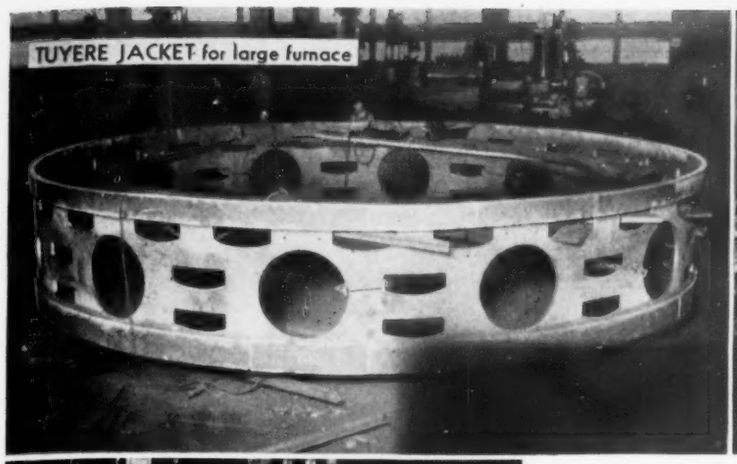
A few railroads attempted the lighting of trains and the use of acetylene headlights, a field of use which lasted for several years.

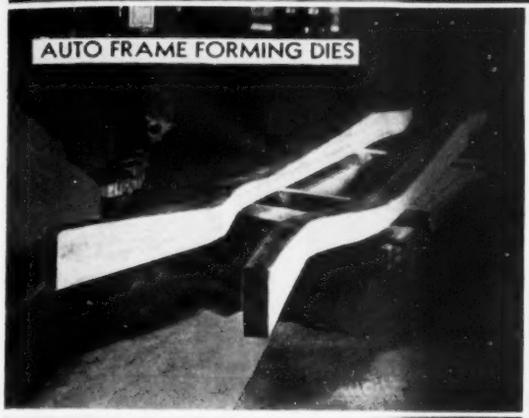
With the birth of the bureau of explosives of the American Railway association, and the now large use of carbide and acetylene, came the necessity of regulating the transportation of carbide, acetylene, oxygen, hydrogen and other articles connected with fuel gases. Again the association found the opportunity for great activity and as an outcome of its effort, rules and regulations governing the construction of cylinders, tensile strength of metal for containers, standardization of packages containing carbide, and the whole system of insuring safe transportation of these and allied articles used by our industry was brought into being. At first, the interstate commerce commission by legislative enactment had jurisdiction only over explosives.

This jurisdiction was expanded to articles classed as dangerous by the Congress and became law. The range of dangerous articles covered such substances as charcoal and cotton, and in the list were of course carbide and all the compressed gasses. The interstate commerce commission took over the rules and regulations of the bureau of explosives governing these articles and they became United States law. Subsequently, these regulations were adopted by Canada and the present safety of these articles in transit and the possibility of universal transportation under the reasonable regulations now existing are the result.

With the development of the chemical phase of the carbide and acetylene industry, a multitude of substances

(*Please turn to Page 57*)

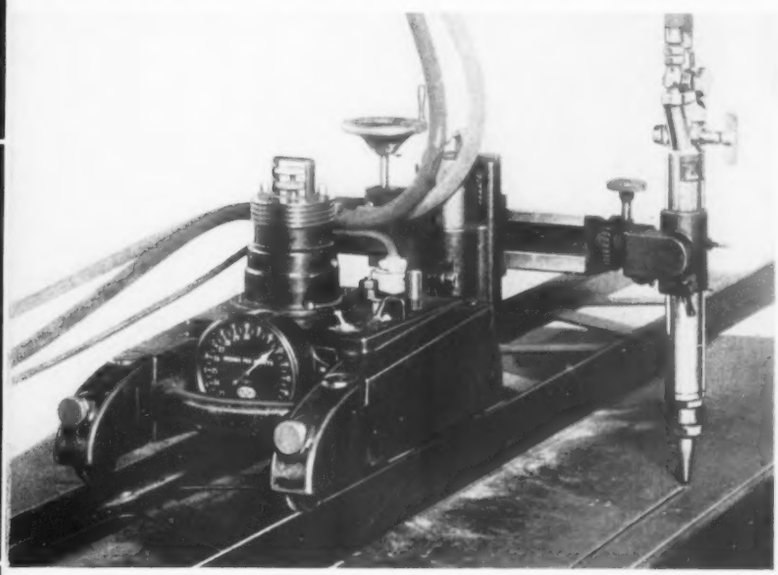




*On Jobs like these*

*you need the* **AIRCO-DB No. 4**

# RADIAGRAPH



**A portable, motor driven oxyacetylene cutting machine for straight line cutting to any length and for cutting arcs and complete circles. Cuts steel sheets, plates, billets, and forgings to any depth practicable for machine gas cutting. A veritable machine shop in itself—a most popular member of AIRCO'S complete line of oxyacetylene cutting machines.**

WRITE for the RADIAGRAPH BULLETIN

**It gives complete details of construction and operation.**

**AIR REDUCTION SALES CO.**
**60 East 42nd St. New York, N. Y.**

DISTRICT OFFICES IN PRINCIPAL CITIES

*For speed and economy . . .* **MACHINE GAS CUTTING**

# Rolled Steel Now Fabricated By Flame Cutting Process

OXYACETYLENE cutting of ferrous metals is a process of preheating the material to be cut to its kindling or ignition temperature and rapidly oxidizing it by means of a closely regulated jet or stream of oxygen issued from a special tool called a cutting blowpipe or cutting torch. It is primarily a chemical process based on the remarkable chemical affinity of oxygen for ferrous metals when at and above kindling temperatures. In addition, there is a noticeable and helpful mechanical eroding effect produced by the kinetic energy or motive power of the cutting oxygen stream which washes away some of the metal in unconsumed or metallic form.

### New Industry Arises

As advanced to date, the oxyacetylene cutting processes have made it economically possible to fabricate heavy gages of rolled steel for all manner of purposes. In consequence there has been created what may be termed a new industry devoted to the fabrication of oxyacetylene cut and shaped rolled steel for heavy machinery and equipment — their bases, housings and forms, thus greatly extending and enlarging the commercial horizon of the lower priced heavy steels, giving greater speed to fabrication and eliminating numerous costly shaping and finishing operations. In addition to linear cutting there are several other types of cutting or controlled oxidation in more or less common use at the present time, including oxygen lance cutting and flame-machining.

As oxyacetylene apparatus in general is easily portable, it can readily be taken to the work thus reducing to a minimum handling of unwieldly objects to be cut. Oxyacetylene cutting operates advantageously in hot as well as cold metal, making it suitable for removing gates, risers or any surplus metal from castings or forgings regardless of the temperature of the object. The initial cost of oxyacetylene cutting equipment being extremely low, as compared with that of mechanical cutting devices capable of performing similar work, has won for it an important place in the equipment of small shops where it is used to undertake a great variety of jobs on material considerably heavier and more intricate in shape than was formerly within the scope of these shops.

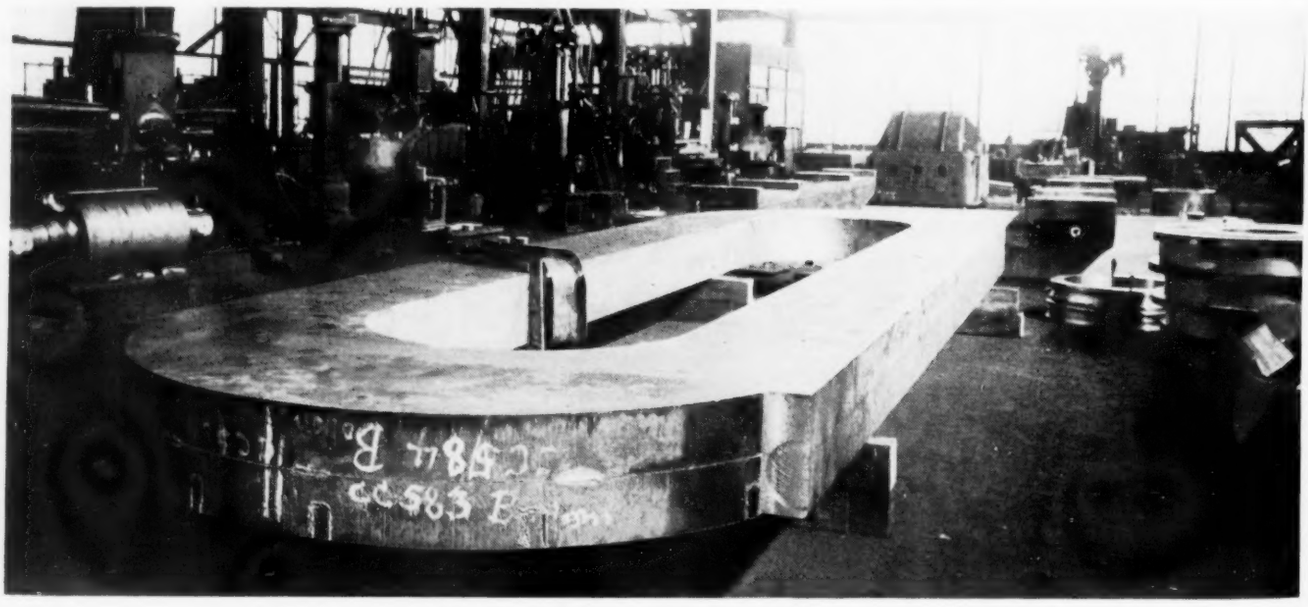
When steel of ordinary temperature is cut with the oxyacetylene torch at an angle to provide a bevel, the heat effect upon the surface cut is slightly different from that where the cut is made at a 90 degree angle in the same part. Beveled cuts due to their longer length through the part, are made at a slower cutting rate and therefore the preheating flames play at a longer interval of time upon the point along the line of cut. Also, the sharpness of the corner of the cut along its bottom edge tends to absorb more of the cutting heat than an abrupt square edge. Where the cut surfaces are welded later, the welding operation acts to anneal them, in fact, it obliterates whatever change the preceding cutting may have produced in and adjacent the cut surface.

**THE accompanying article is taken from a booklet entitled "Oxy-Acetylene Cutting" and prepared by the Oxy-Acetylene committee of the International Acetylene association.**

### May Lack Ductility

When the higher carbon steels or alloy steels are cut, troostite or even martensite may be produced. Steels having these structures may not be ductile enough to withstand the stresses set up. As the steel is heated, it expands, but it is restrained by the adjoining cold metal and the action called "upsetting" results. Then when cooling down occurs, contraction of the upset metal may produce severe stresses and in some cases, the ductility near the cut edge will not be sufficient to prevent cracking. It has been found by experience that if the high carbon or alloy steels are preheated to a temperature on the order of 500 to 600 degree Fahr., the cracking will not occur.

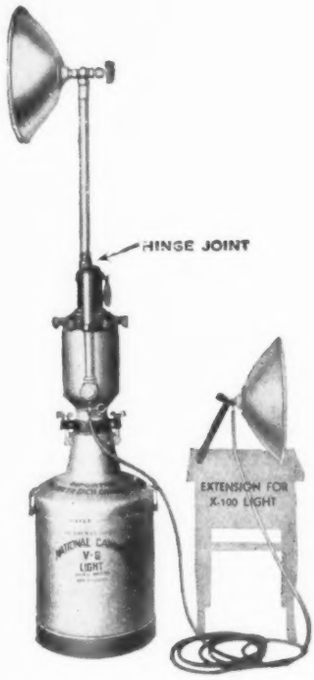
In flame cutting, the selection of the tip having the correct diameter of cutting oxygen orifice, is determined primarily by the thickness of the material to be cut. Surface conditions and chemical composition of material are the most important considerations in selecting a cutting tip with the right intensity of preheating flames. Rusty or scaly surfaces



*Forged steel housing links for a 4-high mill cut to shape by oxyacetylene*

# LIGHT

# Where You Want It
## An Absolute Essential In Construction Work




No. X-100
*National Carbide V-G Light*

No. WL 1-CI
*National Carbide Lantern*

No. Y-199
*National Carbide V-G Handy Light*

**THE NATIONAL CARBIDE V-G LIGHT**

Spreads a full, even beam of about 8000 candlepower right where you need it. Simple in construction without anything to get out of order, it gives ample clear, steady light for about twelve hours on one 7-pound charge of National 14-ND Carbide and 7 gallons of water. Easily handled by one man. Weight 35 pounds empty, 98 pounds when full. No harm done if it tips over: —simply stand it up, and it goes right on working.

Reflector standpipe may be tilted to any angle. Also standpipe and reflector may be folded down along side of hopper for shipping.

**THE NATIONAL CARBIDE LANTERN**

Is the nearest approach to daylight ever found in a lantern—giving ten times more light than an oil lantern, and at less cost. It is sturdily constructed, with convenient handle and extra bail for carrying on the arm. Easily-filled. Easily lighted. Burns eight hours on a single 8-ounce charge of Carbide and one filling of the water chamber. A brilliant rear signal of red, blue or green is supplied without extra charge if required.

**THE NATIONAL CARBIDE V-G HANDY LIGHT**

Is a smaller size consisting of a tank holding 2 gallons of water, a hopper containing a 1¾-pound charge of National 14-ND Carbide and the feeding device. It runs for approximately five and one-half hours on one 1¾-pound charge of carbide and one 2-gallon charge of water and delivers about 1500 candlepower. It is a most handy light to use for emergencies as it is so easily carried around. Weight only 37 pounds when charged. Reflector may be tilted to any angle.

## Specify

NATIONAL CARBIDE IN THE RED DRUM

**For**
**House-Lighting**
**Welding and Cutting**
**All Types Of Carbide Lamps**

You'll Welcome this "nearest-approach-to-sunlight" known . . . NATIONAL CARBIDE . . . because by getting daylight conditions on your night jobs and underground work, you increase the speed and efficiency of your workers. NATIONAL CARBIDE . . . available everywhere . . . always packed in the Red Drum, warehouses and distributors from Coast to Coast.

## NATIONAL CARBIDE SALES CORPORATION

Lincoln Bldg, opposite Grand Central — New York, N. Y.

often are cleaned along the line of cut before cutting, either by cracking the scale loose with the torch preheating flames or mechanically with scrapers or chipping hammers.

Cutting oxygen pressure of itself avails little beyond forcing sufficient oxygen into the cut to oxidize the metal in the path and blow away the resulting oxide. Whereas, excessive pressure causes the cutting oxygen jet to swirl and spread out after leaving the tip, producing a wider kerf with uneven sides and increasing oxygen consumption. For maximum efficiency, cutting tips should be operated at, or near to, normal capacity, but not beyond.

In free-hand flame cutting, the hand cutting torch is both held and guided by the operator. More than twenty different variables, aside from the important one termed the "human element" affect free-hand flame cutting performance.

### Improved Method Used

Heretofore, rivets have been removed by actual cutting off of the head flush with the plate, using a bent tip, or by piercing. However, by a later improved method, the rivet heads are consumed by surface oxidation, which operations is included under Flame Machining.

As might be expected, straight line machine flame cutting is even simpler than free-hand flame cutting. Once the machine and gas pressures have been set, the torch follows the line of cut automatically and need only be advanced uniformly, at proper speed. This latter function is performed either by turning a crank or handwheel or by an electric motor. Some portable motor-driven machines run on sections of straight track, which guide the machine and the torch mounted upon it. Shape cutting is the outstanding example of the extreme flexibility of the process. Regular or irregular shapes of almost any size or thickness, no matter how complex, may be machine flame cut with ease. Machines for this work are mostly motor driven. Some are fitted with tracing devices which are manually guided around the outline of a drawing or templet of the required shape. One or more torches are mounted on the machine so as to describe exactly the same motion as the tracing device over the work, thereby flame cutting the shape traced.

Compared with standard tool machining, the operations of flame machining developed to date, classify with rough machining, however, surface tolerances to within $\frac{1}{8}$ inch as measured by depth gages, are being maintained in some operations.

Several types of tangential cuts classify under "Flame Planing." The principal differences between them relate primarily to the character of application and the tolerance or degrees of surface regularity attained or permitted. Per flame, they all produce a relatively milling type of cut. The profile of the cut can, however, be varied considerably, as also can the general surface of a part.

### Seams Are Removed

Deseaming, a process of flame planing, is being used etxensively for removing cracks or seams in billets, slabs and rounds enroute to the various finishing departments of steel mills and in the steel foundry for exploring and cleaning out cracks and sand holes.

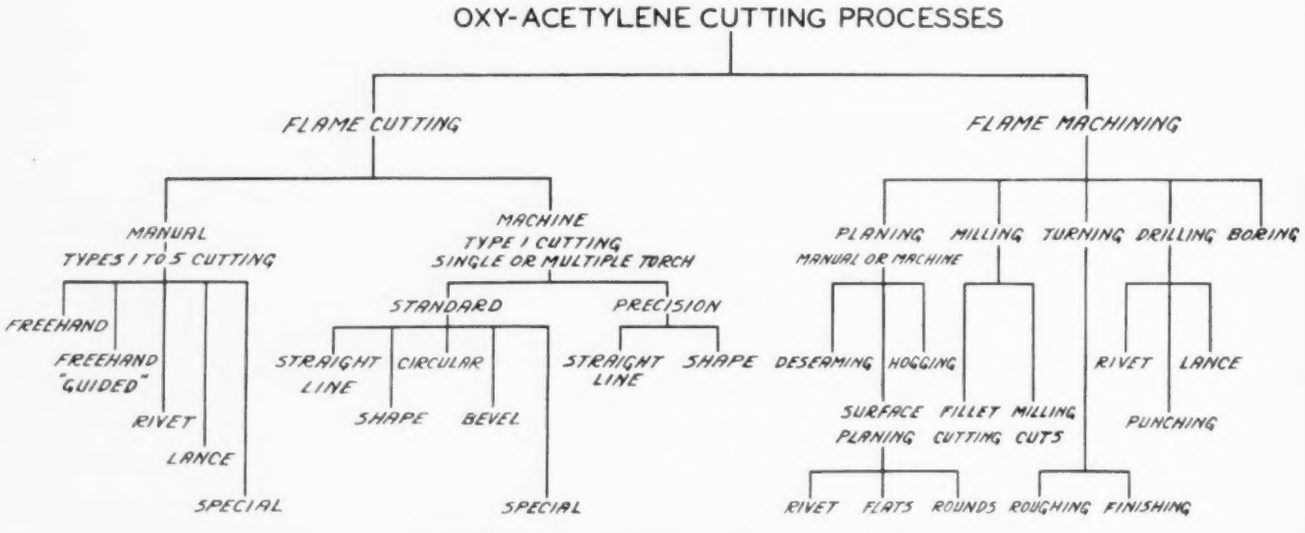
The cutting of concave types of fillets along the edges of rolled steel plates or bars is a development of flame milling which promises a quick and economical substitute for machined fillets. The principal values of such cuts lie in the improvement of the appearance or salability of objects built of square edged plates and in removing sharp edges about working parts of machines. The accurate punching of holes by flame drilling or oxidation is a development of flame machining which appears to be well within the scope of this process. While data are lacking as to the progress being made in effecting parallel sided holes, there is evidence pointing in this direction. The oxygen lance is also a valuable tool for drilling operations, particularly of considerable depth, beyond the reach of cutting tips. Long bolts, frozen in place, are removed from their holes handily with the lance, without scoring the hole. Rough, small diameter holes of considerable depth also can be produced by a modification of the oxygen lance. For such drilling operations, a light carbon burning type of blowpipe handle is used, fitted with suitable lengths of small diameter black iron pipe. The device is capable of producing relatively uniform holes of considerable depth by gradually oxidizing the locally preheated metal to greater depths.

### Ideal for Rivet Cutting

Flame drilling has proven successful for rivet cutting by surface oxidation of heads. Cutting tips used for this operation have large cutting oxygen orifices of low pressure, low velocity type, together with high intensity preheating flames.

Iron and steel foundries have made liberal use of the processes of oxyacetylene cutting since their introduction in the American market; in fact, much of this information rests upon foundry applications and experiences. Until recently this was one of the largest fields for cutting.

One of the principal fields for oxyacetylene cutting, particularly machine flame cutting, is in fabrication. An important branch of fabrication consists of the substitution by assemblies made from flame cut steel plates and shapes or plates and cast steel parts for complete castings. This art has become one of the outstanding recent developments in machine design and construction.




*Classification of oxyacetylene cutting processes*

## Many Problems Are Solved By Acetylene Association

(*Concluded from Page 52*)

now are produced from this prolific source of synthetic chemicals; the International Acetylene association either has taken the initiative or has co-operated with the chemical manufacturers in securing liberal and proper regulations where needed.

With the vast development of the use of welding and cutting torches came problems as to the safety of the articles produced or repaired by this method and here by the exercise of great discretion and patience, the International Acetylene association has secured for the industry a complete change of the rules and regulations governing mechanical structures and repairs of all kinds, including the construction and repair of pressure vessels—an enormous field in which welding came as a startling innovation. The fields opened for the use of acetylene by these changes are limitless.

### Industry Undergoes Expansion

Since the organization of the International Acetylene association in 1898, at which time it was one of the first—if not the first—technical society, the growth of the industry has been phenomenal. At the maximum nearly 300,000 homes were illuminated by acetylene; perhaps 500,000 to 600,000 miners carry acetylene lights when mines are active; cutting and welding torches are far into the hundreds of thousands; the chemical phase of the use of carbide and acetylene includes, of course, cyanamid, acetic acid and a large number of other important substances; the oxygen industry solely because of its use with acetylene has grown from the insignificant beginnings in the medical field to an enormous industry.

Utilization of acetylene and its derivatives has aided in cheapening transportation of oil and gas and developed new methods of making machinery.

The meetings of the International Acetylene association from the beginning have been a forum for the discussion of technical and scientific problems confronting the industry and with each new phase of development has come the necessity of the solution of difficulties not only as regards regulations but in the mechanical construction, chemistry and physics involved in the new process. The widespread and unparalleled development of new fields of endeavor in the acetylene industry has brought to the fore more and more difficult technical problems. As the art of welding and cutting has advanced a deeper study as to the chemistry and physics not only of acetylene and oxygen has arisen but far-reaching research in metallurgy, questions of temperature, character of flame, questions involving particular classes of welding such as pipe line welding, the metallurgy of the welding rod, the application of welding to nonferrous metals, particular problems of mechanical welding as well as mechanical cutting, and the destructive and nondestructive testing of welds. The papers and discussions before the International Acetylene association during the past few years have become when printed—for illustration the reports of the oxy-acetylene committee—classics of the industry. The adoption of the methods so graphically described by authoritative authors on these subjects form a body of literature of such importance that they are a distinct contribution to the advancement of industry throughout the United States and other countries of the world.

From a small group of a dozen manufacturers of houselighting generators, the association has with each expansion of the industry added to its numbers, and an International Acetylene association convention today includes all of those interested in every phase of the industry and an attendance of several thousand is expected at its next annual meeting.

The officers of the International Acetylene association today are H. B. Pearson, Chicago, president; Philip Kearny, New York, vice president; H. F. Reinhard, secretary, and W.E. Cotter, treasurer.


OXYGEN | CARBO-HYDROGEN

ACETYLENE | APPARATUS

CARBO-OXYGEN COMPANY — CARBO

*For Economical*

**CUTTING**

*and*

**WELDING**

**CARBO-OXYGEN COMPANY**

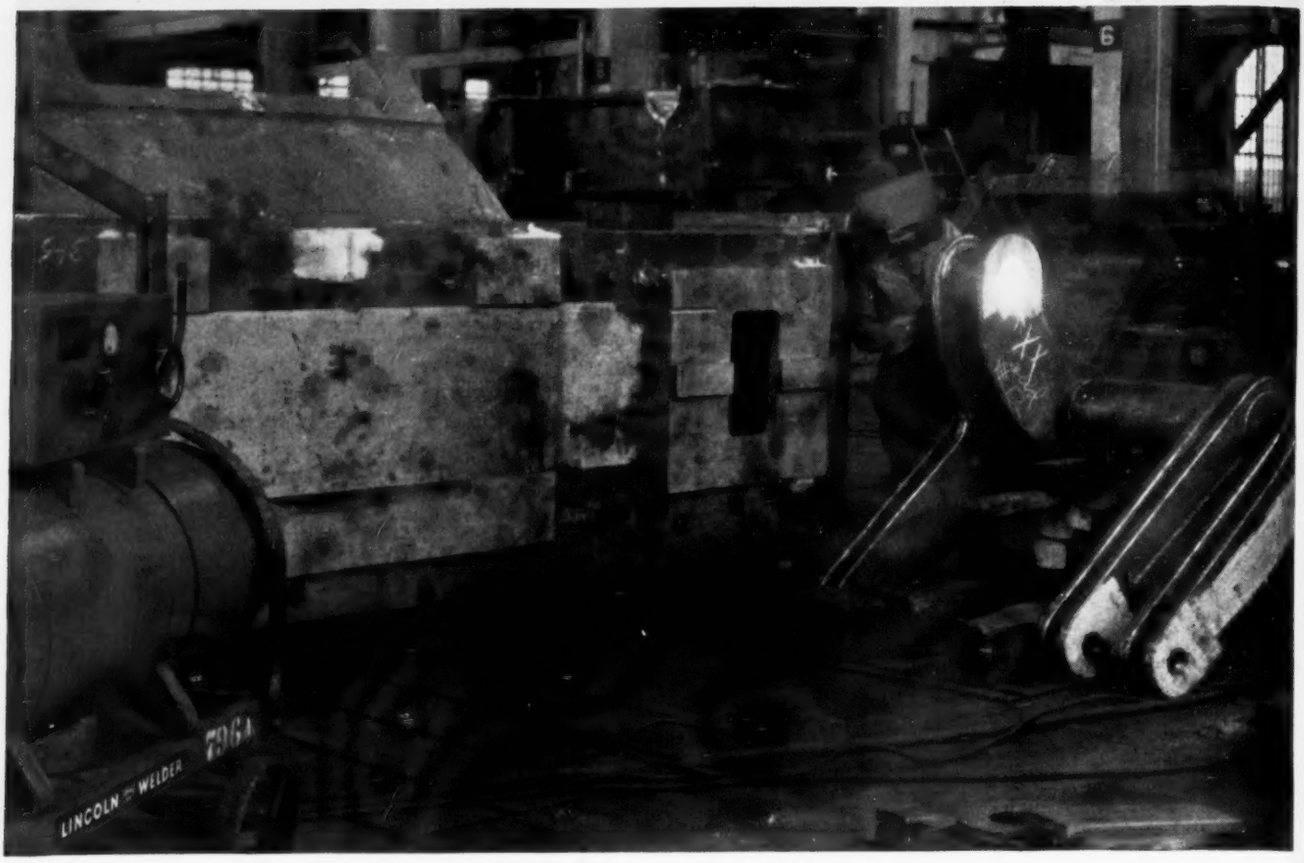
*General Offices:* Benedum-Trees Bldg.

**PITTSBURGH, PA.**

Bayonne, N. J.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Columbus, O.
Coraopolis, Pa.
Erie, Pa.
Parkersburg, W. Va.
Pittsburgh, Pa.
Washington, Pa.
Youngstown, O.

# . . . . *After Flame Cutting* . . . .

# WELD WITH A "SHIELD-ARC"




WELD with a "*Shield-Arc*" to add to the savings made by flame cutting. "*Shield-Arc*" allows you to get the most out of welding. It's guaranteed three ways to give you better welding at lower cost.

"*Shield-Arc*" delivers a uniform current which makes it easy to produce better welds. More of the molten electrode metal goes into the weld. There is less splatter . . . less waste. More weld metal is deposited per unit of time . . . in terms of your pocketbook, more weld per dollar.

Here's another of "*Shield-Arc's*" money saving features—more welding per kilowatt-hour. It is due to "*Shield-Arc's*" high efficiency. "*Shield-Arc*" consumes less power regardless of load. Costs less to operate.

Nine other features help the "*Shield-Arc*" to produce high quality welds at lowest cost. Dual control of welding heat, polarity reversing switch, remote control of welding current without portable accessories or extra cables, laminated magnetic circuit, sparkless commutation, unified controls and center reading meter at handy height, and drip proof arc welded construction—all contribute definite savings in time and money for you.

In no other welder will you find all the features contained in a "*Shield-Arc*". That's why only with "*Shield-Arc*" can you get better welds for less money. Find out now just how much you can save with a "*Shield-Arc*" welder. Ask for a free study of your welding costs. The Lincoln Electric Company, Cleveland, Ohio. Largest Manufacturers of Arc Welding Equipment in the World.

W-87

**LINCOLN "SHIELD-ARC" WELDERS**

## Dies Are Flame Hardened

*(Concluded from Page 42)*

pieces of a certain part with ordinary tool steel dies. After flame hardening them, the output was increased to 6907.

Incidentally, hard faced tools such as taps now are being finished to accuracy of 0.0005-inch, after hard facing, by a lapping operation. Some interest is being expressed in the possibility of lapping hardfaced parts to an accuracy of 0.00025-inch.

## Sources of Welding Work Fall Into Three Groups

A well informed estimate of welding activities indicates that reclamation and repair work leads the field. Repair and maintenance work on railroads, ships, broken machinery and parts, including broken castings and forgings, is said to account for 30 to 40 per cent of all the welding done in this country.

Next in importance as a source of welding business is the production of tanks and pressure vessels, washing machines, refrigeration, furniture, boilers, pipe lines, oil refinery units, cylinders, milk cans, barrels and other fabricated products; this group is said to account for 20 to 25 per cent of all the welding.

Next comes the structural and heavy fabricating industry with about 15 per cent of the total. This includes principally the welding of bridges, buildings, cranes and machinery bases.

As far as electric welding alone is concerned, the first group mentioned above accounts for only 10 per cent of all welding, whereas the second group accounts for 30 to 40 per cent of all electric welding. Equal in importance to the second group is the third group with about the same percentage of the total.

## Over 2000 Tons of Welding Electrodes Used Monthly

Sales of welding electrodes are estimated to be averaging about 4,000,000 to 4,500,000 pounds monthly as for the year 1934.

Some of the representative shops engaged in producing welded work of miscellaneous character consume on an average of 40 to 60 pounds of electrodes per net ton of steel. It is thus indicated that approximately 80,000 to 90,000 tons of steel are welded electrically each month in the United States.

This total makes no allowance for resistance, spot and shot welding. Neither does it make any allowance for oxy-acetylene and thermit welding.

*FARM MACHINE SHED BUILT OF GALVANIZED STEEL SHEETS: Three considerations decided Joseph Birzer, Barton county, Kansas, in his choice of plans when he built this machine shed, according to Capper's Farmer. The galvanized sheet metal lowered construction costs; no paint was required; the shape of the building reduced wind resistance. The shed is 40 x 74 feet. From the floor to the center of the roof it is 22 feet high. The cost when it was built in March, 1930, was $1,200. The building is supported by giant bowed rafters 4 inches square that reach from the foundation on one side to that on the other. These are made by nailing together four 1-inch boards. The entire building is bolted down securely to a poured concrete foundation. Inside is room for tractors, combines, plows, drills and other machinery for handling several hundred acres of wheat, as well as for trucks, motor cars and machine shop. Overhead a place has been made to store lumber. The galvanized sheets were supplied by the American Rolling Mill Co.*

# Precautions To Be Followed when Flame Cutting and Welding Near Combustibles

Whenever it is found that a job requiring flame welding or cutting is located near combustible material, first consider carefully the possibility of moving the part to a more suitable location, says *Oxy-Acetylene Tips* for October. If this cannot be done, any material which might be ignited should be moved entirely away from the welding or cutting operation. This is particularly important when cutting is to be done. Combustible materials which cannot be moved should be protected by adequate sheetmetal guards or asbestos paper. Use water to dampen down wooden flooring. Cover any slowly combustible material with *damp* tarpaulin if there is a reasonable doubt about heat effect. *Dry* tarpaulin should not be used for this purpose.

### Cracks in Floors Are Hazards

Wherever there are floor openings or cracks in the flooring, it is also advisable to make certain that any combustible materials on the floor below are either moved away from the vicinity of the openings, or are adequately protected. Whenever possible, asbestos paper should be spread immediately under the welding or cutting work to prevent sparks from falling through the cracks in the floor.

The cylinders of oxygen and acetylene should, of course, be placed at an adequate distance from the work, particularly when welding or cutting is done overhead.

When it does become necessary to use oxy-acetylene equipment near wooden construction or in locations where combustible material cannot be removed, water hose, chemical extinguishers or fire pails should be located where they can be used quickly.

If work is being carried out in a building equipped with sprinkler protection, it should be the duty of the foreman or other authority to determine that the sprinkler in the location of the job is in good operating order and has not been turned off for repairs or any other reason.

### Practice in Paint Shops

Plants in which flammable liquids or vapors are used, as in paint or lacquer spraying or dipping equipment, might well adopt the policy established by many large plants in the chemical and petroleum industries. In these plants, sections in which flammable gases, vapors or liquids are present, are designated as restricted areas. No work of any kind involving a possible source of ignition may be done within these restricted areas without a permit signed by certain designated authorities, such as the general superintendent. Such a per-

mit is not issued until those in charge have inspected the premises and determined, preferably by means of a combustible gas indicator, that it is safe to do hot work.

In rooms containing flammable vapors or liquids, lint, dust, or any loose combustible stock, cutting or welding should be used only after making a thorough inspection and ventilating the room and, finally, testing the atmosphere. All tanks and other containers with tight covers should be thoroughly drained, ventilated to remove vapors, and either filled with water, or inert gas, or thoroughly cleaned out by steaming or by the use of an approved cleaning material. Where there are dip tanks or other containers near work that has to be done, if they cannot be thoroughly drained, ventilated and cleaned, they should be provided with absolutely tight covers and the welding or cutting operation should be carried out in such a way that they are thoroughly protected from having any sparks fall on or near them. The apparatus generally should not be used just outside dipping or spraying rooms.

An obvious precaution is that equipment should be in good order. Good hose, with connections tight and threads in good condition and modern apparatus listed as standard by fire underwriters' laboratories should be used. Furthermore, this apparatus should be inspected at regular intervals to insure its being in good order.

The oxygen and acetylene cylinders should be mounted securely on a truck or otherwise arranged so that they can not be knocked over.

Extra cylinders of oxygen and acetylene should be stored outside areas in which work of the type discussed in this article is being done.

Those in authority should realize the importance of these precautions and should make certain that they are observed by those in their employ.

The oxy-acetylene flame is to be considered as any other flame or electric arc. There are certain places where no flame should be lighted, there are others where special precautions should be taken before lighting a flame or heating the work, but in general the process may be used without fear if an open flame is justified.

# Making Leak-Proof Joints for High and Low Pressure Service Pipe Lines

THE flange type of joint is particularly adapted to pipe sizes above 2 inches in diameter. Of the many types of flange joints that have been designed and used at various times, only a few have survived the test of prolonged service, according to Wm. H. Dopp Jr. in the October issue of *The Valve World*, published by the Crane Co., Chicago.

For the lower pressures and general service, the screwed flange is generally used. When a re-face job is required, both threads are so cut that when the flange is screwed up tight by machine the pipe projects approximately ⅛-inch through the flange. The flange and pipe are then faced off, or to use the common trade term, re-faced, making a perfectly smooth surface across both the flange and pipe end.

This re-facing permits a gasket to bear directly upon the end of the pipe to make a secure joint. The threads are thus employed only for the purpose of holding the flange to the pipe. Whenever the pipe has not been screwed through the flange, and the thread is exposed to the action of the contents of the pipe, we no longer have a true flanged joint but can expect only the effectiveness of an ordinary screwed joint, unless pipe cement is used in making on the flange.

Sometimes, to insure that only the end of the pipe will be used as a gasket bearing, a straight pipe thread is used and the pipe permitted to project ¼-inch or more through the flange. In such case the flange is not re-faced, but the pipe end is machined to give a perfectly true and smooth bearing.

For higher pressures and more severe services, the lap type joint is generally used. There are two distinct types of lap joints; in each of them the end of the pipe is heated and rolled back on the face of a loose flange, the surface being later machined to give a smooth gasket bearing surface.

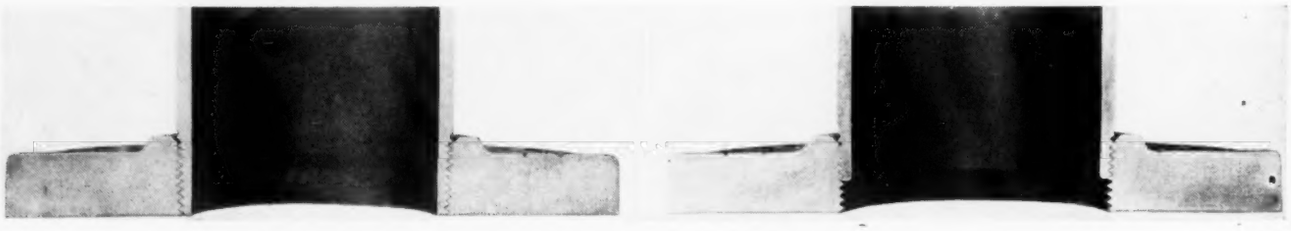
The names of these two joints originate in the method of manufacture rather than in the joint itself since the lapping of copper, and other soft metal pipe, had been practiced long before the process of lapping wrought steel pipe was invented. The first joint of this type was known as the Van Stone joint. It was a round corner lap and in rolling it the pipe was slightly thinned to the edge of the lap. It is still used to some extent. This joint gives a wide bearing for the gasket on the lapped over pipe end, but leaves a small V-shaped groove on the inside of the joint which may retain moisture or sediment and affect the durability of the gasket.

### Overcoming Gasket Troubles

To overcome gasket difficulties thus produced and to bring the gasket bearing to the inside of the pipe, the Cranelap, or true square corner lap, was invented. Here the pipe is first slightly upset and so rolled as to produce a perfectly square corner. The lap is kept to the same thickness as the pipe itself and is increased for other types of facing, such as tongue and groove.

Both screwed and lapped flange joints are used with various modifications to reduce gasket hazard. Male and female, tongue and groove, and other gasket retaining facings, are commonly employed. For high temperatures, where metallic gaskets would ordinarily be employed, the laps are usually made up in a smooth face to face contact and a machined fin or groove on the periphery of the lap is welded to seal the joint. The ring type joint, in which a relatively soft metallic ring of oval shaped cross-section is held in grooves between the flanges in place of a gasket, has lately come into use for extreme temperatures and pressures.

In every instance, the type of flanged joint, the gasket and the flange facing must be selected with a full knowledge of the service which they are to perform. It must be remembered, too, that the flanged joint, like the screwed union, is not to be employed for the purpose of lining up the pipe. That is not its function, and when it is so employed, leaky joints are almost sure to result.



*A properly refaced screwed flange joint shown at the left, with an ineffective screwed flange connection at the right*

# The Yearbook Issue

## January 7, 1935

### What it is—

(1) The Yearbook issue of STEEL, published on the first Monday of each year, is a long established institution in the iron, steel and metalworking industries. Through years of development, it has become the widely accepted, authoritative, annual inventory of progress in these allied industries.

It presents statistics of the past year and compares them with corresponding data for previous years. It reviews the current trend of all important markets, interprets the price situation affecting all essential products, and outlines and comments upon the principal current economic and scientific problems of the industries. In brief, the Yearbook not only embraces in a single issue all of the current and past historical information which one could reasonably expect to find in a reference book, but also contains the analyses and interpretation necessary to enable the reader to apply this information to the peculiar requirements of his business today.

### What it contains—

(2) The 1935 Yearbook issue, dated January 7, 1935, will contain:

A thorough-going summation of the present status of industry in relation to the government administrations recovery program. This will embrace a series of articles dealing with NRA code administration, the famous Section 7a, open prices versus fixed prices, the minimum wage-maximum hour legislation, arbitrary curbs upon the growth of capacity, employe representation plans, job insurance, pension plans, confiscatory taxes, etc.

Whither the iron, steel and metalworking industries? A critical study of important economic trends, touching upon the shifting of markets geographically and in relation to products, the ascendancy of certain products and processes in the competition between methods and materials, the effect of continued consolidations and mergers, the influence of railroad rates, etc.

Where does the annual output of finished steel go? Last year STEEL's annual analysis of distribution showed that tinplate is a remarkably stable product under depressed conditions. The figures for the current year—the 13th annual compilation—may reveal significant realignments in consumption.

The last word on the development of alloy steels. By statistics, text and illustration, STEEL will show the truly remarkable progress of these special steels in 1934. Resume of progress in metallurgy, engineering and research in every department from blast furnace, steelworks and rolling mill through to the intricate processes of manufacture and assembly.

List of additions to and modifications in blast furnace, steelworks and rolling mill facilities.

An analysis of the current iron ore situation, with special emphasis upon the important problem of confiscatory taxes.

STEEL's regular feature "The Business Trend," expanded to show by graphic charts the essential steps in the march of business through the year.

Condensed, concise annual reviews of the domestic and foreign iron and steel markets.

STEEL's "Market History"—tables of iron and steel prices by months, extending over a period of 35 years. "Windows of Washington", "Mirrors of Motordom," "Making the Most of Methods and Materials," "Progress in Steelmaking," "As the Editor Views the News" and other regular features which make STEEL industry's most distinctive business paper.

### Where it goes—

(3) Over 10,000 copies will be printed and distributed throughout the world to every branch of industry using or producing steel and iron in any form. The Producer, Fabricator, Manufacturer, Engineer and Banker find this volume of great assistance in checking past performance and laying future plans.

### Who reads it—and keeps it—

(4) Many thousand executives — presidents, proprietors, vice presidents, secretaries, treasurers, works and general managers, purchasing agents, engineers and foremen know, read and preserve the Yearbook for the completeness of its information and its continuous reference value.

### Why Advertising Value—plus

(5) Because of the admitted value of the Yearbook from the editorial standpoint the advertising it contains is unusually important. It serves to complete the story—is available for reference throughout the year and when properly planned is an important supplement to any yearly campaign.

The Where-To-Buy directory—complete and accurate as to advertisers—supplies information to buyers on thousands of individual products, processes and services.

### What kind of copy to use and why—

(6) Copy should be a combination of straight display and catalogue type. The Yearbook supplements the week to week issues, so advertising should be prepared to arrest attention at the first reading and also be sufficiently complete to make it of continued reference value. A campaign of advertising brings out either (A) individual points of a product—one point to an issue—or (B) covers the entire line—one item at a time.

Advertising in the Yearbook should present all the points or all the products. Make it the "Master Advertisement" of the campaign, or if used singly, tell the whole story of your product, process or service.

# LARGE USES OF STEEL IN SMALL WAYS

273rd Article ◆ Steering Gears

FEW mechanical parts of a motor vehicle contribute so much to its ease of operation as the steering gear, and with the construction of few parts is the average driver so unfamiliar. Required to guide the thousands of pounds of a passenger car, bus or truck with only a moderate amount of manual exertion at the steering wheel, this mechanism must be rugged and of exacting design. Steel is used primarily in providing this strength, consumption of rolled and forged steel recently for this purpose having ranged from less than 20,000 to more than 65,000 tons annually, in addition to a substantial tonnage of malleable castings.

While originally steering gears were designed largely for use on passenger cars, trucks and buses, and the bulk of production is taken by manufacturers of such equipment, they also have been adapted for operation of boats, lumber carriers, farm and industrial tractors, road graders, portable shovels and similar equipment.

**Improvements Spell Easily Handling**

The lack of effort with which the modern steering gear is operated compared with the gears in use during the early days of the automobile indicates the progress made in design by this industry. With present equipment quick turns are negotiated easily; road shock is not transmitted to the steering wheel and to the driver, thus tending to eliminate swerving of the car; and turning of the front wheels while the vehicle is standing still no longer is a difficult task.

One of the earliest types of steering gears was, in effect, a screw and a nut; turning of the former by means of the steering wheel resulted in a lateral motion of the nut which actuated the front wheels. Popular types in use today include the cam and lever, worm and sector and worm and roller.

Differing somewhat in the principle of design, various types of steering gears are fairly comparable in weight, ranging from about 20 to 100 pounds and being made principally of steel forgings, tubing, bar stock and malleable iron castings. Illustrated is a cutaway view of a cam and lever type of gear, the solid portions being steel and the phantom section being the malleable iron housing which comprises about 35 to 40 per cent of the total weight of the unit.

—Courtesy Ross Gear & Tool Co., Lafayette, Ind.

*Phantom section of cam and lever type of automobile steering gear. Solid portions are steel; housing is malleable iron*

When the gear is operated, turning of the cam causes the stud, which is affixed to the lever shaft, to move, thereby transmitting motion to the steering arm. The latter is attached solidly to the lever shaft. In the design shown the stud is mounted with roller bearings, permitting it to turn and reducing the wear and friction that would result from a sliding contact between the cam and stud. Adjustment of the clearance between the lever shaft stud and the cam is obtained by means of a screw, the head of which projects outside the housing. Gears having a fixed stud are used in some instances, however. Ball bearings mounted at both ends of the cam also aid easy operation.

The variable pitch cam is turned from a carbon or alloy steel bar by vertical milling, ground on a specially designed grinder, case-hardened and copper-plated. Plating forestalls corrosion, and, in addition, gives added smoothness to surfaces under contact. The horizontal lever shaft is a carbon or alloy steel forging and also is case hardened. Both the end of the lever shaft and the steering arm are serrated to provide a tight fit between the two parts. The latter, a forging, is serrated cold by means of a punching operation.

Two main sections of steel tubing are required for the steering gear. These are a wheel tube, which is affixed to the cam at one end and to the steering wheel at the other, and a jacket tube, which, with the steering wheel, are the only parts of the mechanism usually seen by the driver. A thrust nut pressed on one end of the jacket tube is threaded into the housing. In addition to this tubing small tubes to carry wires for the electrical system of the vehicle from beneath the hood to the steering wheel are located inside the main tubing.

## Steel Springs Guard Hot Room Against Vibration

A novel use of steel springs has been developed in connection with a new "hot room" erected by Kelvinator Corp., Detroit, for research work on reactions of refrigerators, water coolers and air conditioning apparatus operating under excessive temperatures and other adverse conditions. The entire laboratory, including the concrete floor slab, is mounted on steel springs to minimize vibration. The room is insulated against the passage of heat and is completely equipped with the instruments required for detailed checking of the refrigerating units under observation.

A special humidity testing laboratory, for studying the effect of "sweating" in cabinets also has been completed by the Kelvinator Corp.

## Will Study Properties of Metals for Aircraft

Properties of metals at low-temperatures entering into the construction of aircraft are of great importance, according to the National bureau of standards.

Aircraft operating at the relatively higher altitudes are cooled rapidly to subzero temperatures and must continue to perform without failure in spite of the static and dynamic stresses to which they may be subjected at these low temperatures, it was stated.

While many metals increase appreciably in tensile strength as they are cooled to temperatures below freezing, their resistance to shock frequently becomes low.

At the request of the navy department the National bureau of standards is preparing to study the mechanical properties at subzero temperatures of a number of the steels and nonferrous metals which are of major importance in aireraft structures.

# Gas Research Aims at Lower Costs, Improved Equipment

ADVANCEMENT in the industrial application of gas, with emphasis particularly on operating efficiency and the refinement of existing equipment, was reflected at the sixteenth annual convention and exhibition of the American Gas association in Atlantic City, N. J., Oct. 29-Nov. 2. This advancement was manifest both in papers presented and equipment displayed. Some interesting developments in equipment maintenance also were revealed.

With more than 4000 registered, attendance was the best since 1930, a fact especially gratifying to the more than 160 exhibitors, with space which comfortably filled the municipal auditorium. The exhibitors included a number primarily identified with iron and steel and foundry industries; also refractory manufacturers and makers of industrial equipment of various descriptions, from small, fine precision instruments to units of much larger and sturdier character.

New officers of the association are listed on this page.

WHAT is being done by operators to reduce maintenance cost through the use of wear and corrosion-resisting materials, welding, new methods of oven, standpipe and door lining was outlined in a general report by F. J. Pfluke, Rochester Gas & Electric Corp., Rochester, N. Y., with comments as to economy in maintenance based on a summary by C. R. Locke.

For grizzly disks and chute liners, one plant is now using hard cast iron of the mottled type with an average brinell hardness of 350-450 with good results and a comparatively low cost. Grizzly disks made of this material usually will screen between 50,000 and 60,000 tons of coke before showing 10 per cent oversize in the coke. Another plant is using a hard metal for chute lining and grizzly disks—an alloy of close grain structure which costs 50 per cent more than chill iron, but which lasts several times as long.

The most common material used for chute lining is vitrified brick, it was said. This gives excellent satisfaction and longer life at a lower cost than cast iron. One advantage of a brick lined chute, it was stated, lies in the fact that replacement can be made of a portion of the brick without renewing the whole chute. Vitrified brick is used widely as surfacing for coke wharves, replacing cast iron plates, formerly used for this work.

The greatest saving through the use of wear-resisting materials, the report revealed, has been in large castings on which there is considerable machine work, particularly producer castings. In the past it was necessary to use a metal soft enough to be machined, which consequently would not wear well. These castings now have been redesigned so that the parts subject to wear will require no machining and hence can be made of wear-resisting alloys. This type of construction, it was said, has worked out particularly well in the producer grates and skirts.

Stellite is being used to a great extent for building up door hooks and on the dry quencher fan, which is subject to severe erosion due to the coke dust in the circulating gases. Before using this material, it was stated, it was necessary to shut down the dry quencher every four to six months; now, by using stellite for coating the parts subject to severe wear, it is possible to operate the fans a year without interruption.

Stellite, stoodite and other hard-facing materials usually are furnished in the form of welding rods and applied to the wear-resisting surfaces by either acetylene or electric welding. The rods usually are nonferrous and composed of alloys of cobalt, tungsten and chromium. While expensive, these materials often show an economy when applied to such parts as hammers for coal pulverizers, large sprocket teeth, carbon cutters, water-cooled beams in water gas machines, or in similar services where great resistance to abrasion is required. Tungsten carbide is also available in the form of welding rod and has been used by one operator with good results on certain tools.

Standpipes with a welded steel shell lined with 2 or more inches of refractory material are coming into use, one speaker stated. Two general types of refractories are used, one a plastic refractory which must be rammed into the standpipe mold and the other a type which can be mixed fluid enough to be poured. From experiences to date, the use of these materials has decreased the cost of standpipe maintenance, it was asserted.

Recently the use of poured linings has been extended to the lining of oven doors, and in plants where door brick and brick laying labor are expensive, large economies have resulted. Oven floors, it also was pointed out, can be kept in tight condition by floating a thin layer of certain specialized cements over the old bricks rather than by expensive replacement of the floor brick. The report revealed also advancement in chute design to minimize coke breakage.

### Study Coke Dustproofing

The use of fine coke screenings in producer and coal mixtures also was discussed, although aside from a study made at one plant little was reported as done by the committee, which confined its main activity to a study of coke dustproofing. According to a committee member, H. J. Meredith, Koppers Gas & Coke Co., Kearny, N. J., dustproofing agents may be classified as follows: (1) Solutions of deliquescent salts, (a) calcium chloride and (b) calcium chloride and magnesium chloride; (2) oils, (a) heavy petroleum oils containing their own emulsification agents, and (b) oils emulsifiable with sodium resinate; and (3) miscellaneous, (a) sulphite liquor and (b) a mixture of salt, soda ash and a by-product of glycerine manufacture.

Recent developments in the manufacture and mixing of a suitable substitute for a high B.t.u. gas that can be produced in a standard water gas set were discussed in the report of the water gas subcommittee, headed by H. B. Young, Chicago By-product Coke Co., Chicago. These developments indicate, among other things, that a satisfactory substitute for natural gas can be produced in a standard water gas set; also that a number of large companies, which formerly distributed a manufactured gas have changed to natural gas

## New Officers

**AMERICAN GAS ASSOCIATION**

**President**

PERCY S. YOUNG

Vice president, Public Service Electric & Gas Co., Newark, N. J.

**Vice President**

L. B. DENNING

President, Lone Star Gas Co., Dallas, Tex.

**Chairman, Industrial Gas Section**

I. F. QUINN

Brooklyn Union Gas Co., Brooklyn, N. Y.

**Vice Chairman, Industrial Gas Section**

C. W. GALE

Public Service Corp. of Colorado, Denver

**Chairman, Technical Section**

C. A. HARRISON

Henry L. Doherty & Co., New York

**Vice Chairman, Technical Section**

F. A. LYDECKER

Public Service Electric & Gas Co., Newark, N. J.

or a mixture of natural gas and manufactured gas of 700 to 800 B.t.u. The production of a high B.t.u. gas as a substitute will provide emergency capacity in event of a failure of the supply of natural gas and in addition is valuable under some conditions in meeting peak loads.

A NEW gas-heated rotary forging furnace, built by the Gas Machinery Co., Cleveland, was described. The furnace was designed to improve the quality of forgings by reducing to a minimum scale formation and surface decarburization, thus prolonging die life and allowing for the finishing of forgings to closer tolerances. A feature of the furnace is the atmospheric control by a water seal, which serves to prevent infiltration of air, and by syphon vents in the side walls to carry away any water vapors.

Among other developments reported by equipment builders is a new low pressure, all-welded gas holder, designed by the Western Gas Construction Co., Fort Wayne, Ind.

Discussing improvements in mechanical pipe joints and the prevention of bolt and nut corrosion, J. A. Perry, United Gas Improvement Co., Philadelphia, declared, with regard to joints under test, that, in his opinion, the blunt nose types, reinforced front and back with asbestos, appear likely to be the most desirable for standardization and general use.

His general conclusions from tests relative to bolt and nut protection of mechanical joints were that insulating the bolts should reduce electric corrosion of the bolts and nuts, and that capping the nuts and heads of the bolts with an insulating material filled with waterproof plastic should also protect against corrosion.

Other methods for reducing corrosion, he said, include the use of suitable waterproof compressible sleeves or grommets; the use of metallic shields which form an integral part of the follower ring; the use of separately formed metal cup washers; and the application of suitable flexible waterproof caps forced or cemented over the heads and nuts of the bolts.

### Eliminate Nascent Oxygen

Discussing the possible oxidizing effect of neutral furnace atmospheres, F. O. Suffron, research engineer, American Gas association testing laboratory, Cleveland, declared that an oxidizing agent in the form of nascent oxygen may exist in a furnace atmosphere even though ordinary methods of analysis may indicate that a neutral condition exists within the furnace unless the dissociation of carbon dioxide and water vapor is considered.

To eliminate this nascent oxygen a less oxidizing agent in the form of excess air can be introduced into the combustion zone, Mr. Suffron said. If a gas flame is located within the process heating chamber, however, as in the case of overfiring, it is possible that a higher percentage of excess air will be necessary in order to preclude the possibility of part of the large quantity of nascent oxygen that is formed in the flame being circulated around the work.

It is possible, the speaker said, that a portion of the scaling trouble caused while heating metals under recent tests may have been due to the presence of nascent oxygen in supposedly neutral atmospheres. This extremely active oxidizing agent, as well as the carbon monoxide and hydrogen, may be eliminated by permitting a certain amount of excess air to exist within the furnace, Mr. Suffron concluded.

"Furnace Atmosphere Control" was the subject of an interesting paper by W. M. Hepburn, Surface Combustion Corp., Toledo, O., and "Effective Saving of Gas Fuel by Use of Insulation Refractory Materials" the subject of another by R. P. Wilson, the Philadelphia Gas Works Co., Philadelphia.

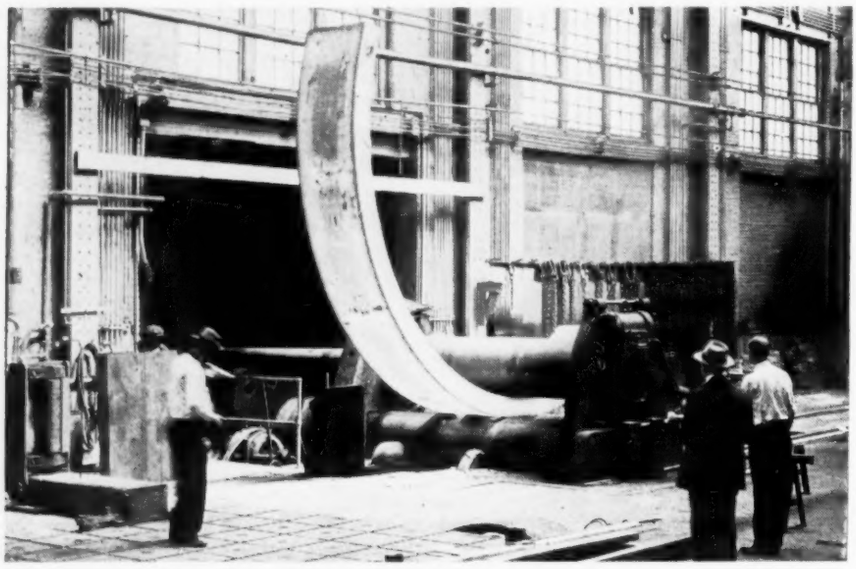
IN HIS review of work on pipe coatings and corrosion for 1934, Dr. Scott Ewing, American Gas association research associate, with the national bureau of standards, Washington, found response among pipe manufacturers present when he stressed the importance of determining first the corrosiveness of soils traversed by a pipe line before coating or reconditioning the line. Such practice on the part of users would add materially to the life and service of the pipe, manufacturers have contended.

Dr. Ewing discussed soil corrosiveness surveys, outlining the method he used, and said that such surveys properly timed and conducted resulted in considerable saving not only in the checking of corrosion, but in the method of doing it.

Silica gel and its uses in conditioning air and gases for industrial processing were discussed by J. Maynard Lednum, engineer, Silica Gel Corp., Baltimore. Silica gel was described as a manufactured material obtained from the reaction of a soluble silicate, such as waterglass, and an acid, such as sulphuric; the two components being of definite concentrations and mixed in a definite ratio. Typical data on the absorption of gases and vapors by this material were presented; also arrangements of equipment applicable to processing operations where either low or controlled humidities are required.

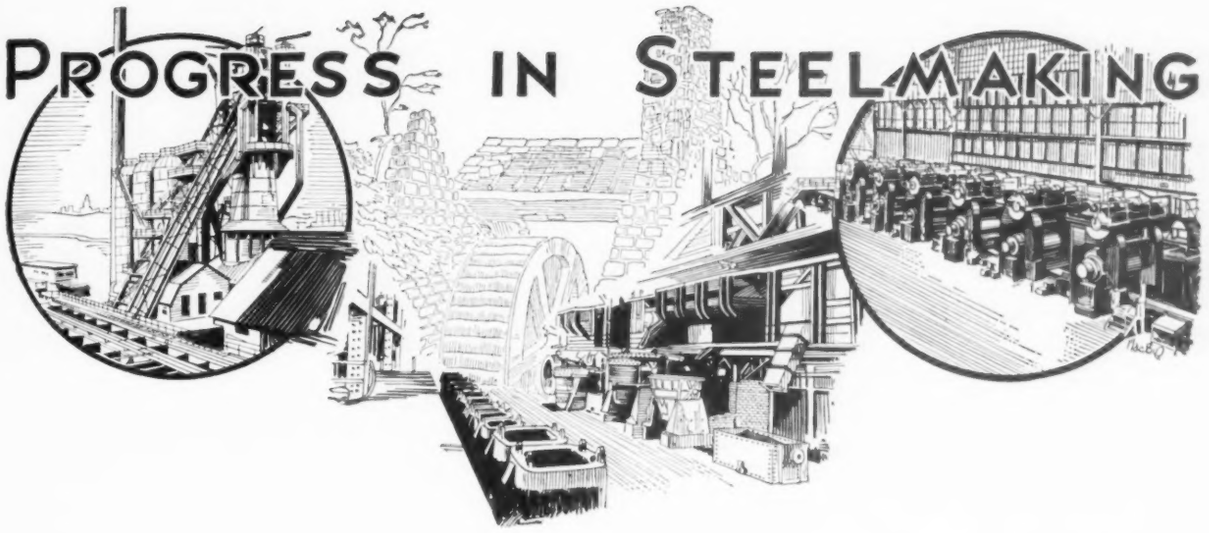
DISCUSSING internal corrosion of natural gas transmission lines, Elmer F. Schmidt and Thomas S.

(*Please turn to Page 70*)



*BENDING 15-TON GENERATOR ROTOR RIMS: Twelve of these massive semicircular rims, each forming half of a rotor rim and carrying field poles, have been rolled in the Schenectady, N. Y., works of General Electric Co., for use in waterwheel generators to be installed in a hydroelectric development of the Kanawha Valley Power Co. in Virginia. Each half-section is made from a slab of rolled steel plate, maximum 0.20 per cent carbon, measuring 26 feet 7 inches in length, 34 inches in width and 9½ inches in thickness. The slab is heated for 6 hours at a temperature of 1100 degrees Cent., and is passed rapidly back and forth through the bending roll while workmen gage the changing diameter by means of a marked rod inserted through lugs fastened to one side of the slab. Sheet metal templates also are used to check contour, and temperature is watched by optical pyrometer. Finished section, 32 inches wide and 8 inches thick, is completed in less than 20 minutes from the time the slab leaves the furnace*

# PROGRESS IN STEELMAKING



HIGH-CARBON and alloy steel billets are being reheated at a plant in the Pittsburgh district with producer gas. Under normal operation the waste gases enter the recuperator at 2100 degrees Fahr., the air being preheated to effect a 40 per cent saving over a simple oil-fired furnace. The furnace is a natural draft type with the recuperator arranged to maintain a natural constant positive pressure in the heating chamber, thus insuring uniform heating of the steel regardless of its position on the hearth.

• • •

### MOVEMENT IS CONTROLLED

Good use of a photoelectric tube is being made by an Ohio pipemaker in facing the ends of welded pipe. The cutting tools are brought up at high speed until they are about ⅛-inch away from the ends of the pipe; then the speed is reduced. When the tools are in the correct position, they intercept a beam of light and the cutting occurs. By use of this tube, the pipe-facing operation has been speeded up materially compared with former practice.

• • •

### RECOMMENDS MOLD COATING

Dry refractories such as hydromagnesium silicate, talc or soapstone are recommended for coating ingot molds. In addition to protecting the surfaces, these materials should afford an improvement in the rate of heat transmission through the mold walls.

• • •

### INTRODUCES NEW LINING

Silica firestone for use in lining cupolas and bessemer converters has been introduced. The method of lining consists of using a wedge-shaped stone block in the melting zone with allowance for expansion on preliminary heating. As soon as the blocks have burned back sufficiently, a slab lining for resurfacing of silica firestone split rock is placed in the melting zone completely covering the stone blocks. Claim is made that the firestone holds up under severe service and that it is possible to maintain a fixed diameter in a cupola with great ease.

• • •

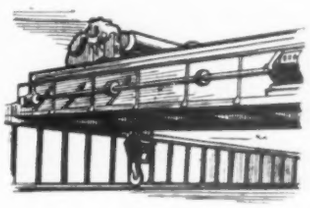
### VARIOUS GRADES AVAILABLE

A new semimetallic packing which combines shredded alloy lead of high lubricating qualities with asbestos, graphite and a variety of lubricants has been placed on the market. The curly lead alloy shreds attach themselves to the fibrous constituents of the packing. Several different compositions are available for steel plant application.

• • •

### REDUCES LUBRICATING COST

Lubricating the journals of overhead cranes, trolleys and bridges, hot metal and cinder cars and ore cars with a special pad of felt built with a spider to prevent it from slipping has greatly reduced the lubricating



costs at many steel plants. At one plant tests on a 35-ton crane showed the oiling device to be in good condition after having been in operation 112 days without the addition of oil. They were installed easily and required no frequent inspection or attention.

• • •

### FACILITATES INSPECTION

To facilitate inspection at intervals and to simplify painting of the surface the steel acid tanks of a continuous pickling unit in the Chicago district are mounted above the floor level. The tanks are provided with steel hoods which not only effect the removal of fumes but also deflect any condensate back into the tank proper for further use.

• • •

### CHANGES PHYSICAL VALUES

Stress strain determinations in steel wire intended for bridge cables, according to the bureau of standards, Washington, have shown that steel wire hardened by cold drawing assumes a greater permanent elongation under like values of tensile stress than does steel wire of similar composition hardened by heat treatment so as to have the same ultimate tensile strength. Under the test conditions used, the limit of proportionality of strain to stress for cold drawn wire seemed to be influenced to a greater degree by the time during which the tensile stress was applied than was the case for heat-treated wire.

• • •

### DEVISES RAPID ANALYSIS

A suitable method of analysis for molybdenum in iron and steel has been devised which has the advantage of being rapid, the time required to make the determination ranging from 1½ to 2 hours compared with about 4 hours when the usual sulphide method is employed. The presence of phosphorus does not interfere with the estimation. Molybdenum shows even though only a trace is present.

# Technical Control Achieves New Value in Foundries

IN THE foundry industry, as in nearly all other productive fields, the steady advance of technical development continually brings new achievements in quality of product and lowered cost of production. The thirty-eighth annual convention and exposition of the American Foundrymen's association, held recently in conjunction with the fifth international foundry congress in Philadelphia, served admirably to emphasize this fact. A wide range of papers from this country and abroad covering practically every phase of foundry operation, roundtable discussions of foundry problems, forums on shop practice and an extensive exhibit of foundry equipment were high lights of this well-received convention. Many of the events were reviewed in STEEL last week; what follows summarizes a few additional discussions.

## Develop Theories on Gas and Inclusions in Steel

EXCHANGE papers of the Czechoslovakian Foundry association and the Institute of British Foundrymen were delivered at a steel founding technical session during the A. F. A. convention in Philadelphia, Oct. 25. The first paper, describing some problems of the physical chemistry of steelmaking, was prepared by P. Herasymenko and E. Valenta of the Skoda Works research institute, Pilsen, Czechslovakia, and was presented by C. E. Sims, American Steel Foundries, Chicago.

In the paper the authors discussed the amount of oxidic inclusions which may be expected in steel made in the acid open-hearth and basic electric furnaces, respectively. From equilibrium equations and reaction rate constants the amounts of different oxides present can be calculated and tables showing these calculated values checked closely with experimental results.

### Theory of Gas Evolution

One section of their investigation was devoted to the evolution of gas in molten steel. The theory advanced was as follows: When liquid steel is taken out of the furnace in a ladle, it usually contains only a small excess of iron oxide over that which will be in equilibrium with the carbon content of the metal, so that the reaction rate is low. The rapid cooling of the metal brings about, however, the displacement of the oxidation-reduction equilibria for manganese and silicon. These equilibria depend to a great extent on the temperature, and therefore the cooling of the metal is accompanied with the separation of silicate inclusions. The composition and properties of these inclusions will vary with the content of manganese and of silicon in the metal. The iron oxide extracted by silicate inclusions, being now in a more concentrated form, can react with carbon in the metal.

The paper presented numerous interesting explanations involving gas evolutions, deoxidation and nonmetallic inclusions. In the opinion of those present, careful study of the material was seen as having a definite, practical value to steel foundrymen.

### Factors That Cause Fluidity

H. Spence Thomas of the Iron and Steel Institute of Great Britain presented the British exchange paper on the subject of steel castings, written by W. H. Hatfield, director, Brown-Firth Research Laboratories, Sheffield, England. Dr. Hatfield portrayed an interesting picture of steel casting work in England, pointing to the great diversity of designs and the large number of so-called "oddment" orders encountered in steel foundry practice there.

Outlining the need for increased research in steel castings, he referred to the problem as yet unsolved of the apparent fact that fluidity at times appears to be influenced by the physical chemistry of steelmaking and to be, in a measure, independent of the actual temperature. Casting conditions and the use of feeder heads were commented upon, and several examples given of the proper application of feeder heads to produce sound castings even where the variation in the section is considerable.

Maj. R. A. Bull, consultant on steel castings, Chicago, paid tribute to Dr. Hatfield's paper, remarking that it contained many good suggestions for American foundrymen. He went into the matter of design, stating that designers always ask much of the foundryman and too often the latter tries to cast a complicated design without attempting to simplify it.

Asking for critical comments rather than laudatory remarks for the author of the paper, F. A. Melmoth, Detroit Steel Casting Co., Detroit, said he was sure his friend, Dr. Hatfield, would rather have "a fight" on his hands than mere complimentary utterances. To start the ball rolling in this direction, Mr. Melmoth cited what he termed a few misconceptions which Dr. Hatfield apparently had regarding American foundry practice, chief of which was that in this country the main job of foundrymen is to produce large numbers of the same type of casting and not to be so much concerned over the matter of diversity of production. Mr. Melmoth stated that he thought a greater diversity of castings was produced by American foundrymen than was produced anywhere in the world.

### Little Welding in England

In support of this view, P. E. McKinney, Bethlehem Steel Co., Bethlehem, Pa., showed slides of a recent casting made by Bethlehem, a 230-ton hydraulic press platen which required metal from six open-hearth heats and was poured from four ladles simultaneously. Mr. McKinney also brought up the matter of welding castings, either to salvage them or for assembly purposes. J. B. Allan, an English foundry operator, pointed out that in England welding a casting has been considered almost a "heinous offense."

To avoid the laborious operation of sectioning a casting at various locations to make sure of soundness, C. W. Briggs, Naval Research Laboratory, Washington, pointed out how successful use can be made of X-ray and gamma-ray methods. These methods give a sure check on the presence or absence of defects and at the same time do not necessitate spoilage of the casting.

## Impact-Torsion Test for Cast Iron Proposed

TESTING cast iron was the subject of a joint session of the A. F. A. and the American Society for Testing Materials in Philadelphia, Oct. 26. R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee, opened the meeting with a paper which described the various test methods available and their application in ascertaining desired information on physical properties.

In discussing the paper F. G. Tatnall, Baldwin-Southwark Corp., Philadelphia, mentioned that he believed an impact test which applied a torsion just at the instant of the blow had possibilities for testing cast iron. He stated the particular test was employed successfully for glass, ceramic materials and others.

One speaker stated there was no connection between tensile strength and impact value, and that in tests

using the same base mixture with different alloying agents one gave a tensile strength of 57,600 pounds per square inch with an impact value of 80 foot-pounds while the other showed a tensile strength of 52,400 pounds per square inch with an impact of 38.6 foot-pounds.

### Factors in Chilling

W. H. Spencer, American Cast Iron Pipe Co., Birmingham, Ala., presented a paper on the chilling properties of cast iron which referred to those irons used for cast pipe. He said that increasing phosphorus content in those irons decreased tendency to chill, and that when the manganese content was about 0.35 per cent greater than the theoretical manganese minus 1.7 times the sulphur there was little tendency to chill. Increasing sulphur increased the chill, and also led to a sharp demarcation between chill and gray portions in the iron.

Fatigue tests of high strength cast irons were described by H. F. Moore, and J. J. Picco, University of Illinois, Urbana, Ill. Results indicated that in general the fatigue tests of such irons are approximately proportional to the static tensile strength of the irons.

## Melting Equipment for High-Test Iron Improved

RECENT developments in melting gray iron, particularly in the production of iron for special requirements, were discussed at an A. F. A. roundtable meeting under the chairmanship of E. R. Young, Climax Molybdenum Co., Chicago. In opening the discussion, W. R. Bean, Whiting Co., Chicago, briefly referred to the fact that special iron for rolls had been made in England as far back as 1823. In this country high strength irons have been made for over 100 years at the plant of the McIntosh-Hemphill Co., Pittsburgh, and for over 70 years in the plant now operated by the Hunt-Spiller Mfg. Co., Boston. These irons are made in the air furnace.

### Rotary Furnace Economical

For large amounts the cupola always has been the most economical melting medium, but for comparatively small amounts of special iron the rotary furnace operating on pulverized coal is most economical and efficient. High test iron is a low-carbon iron particularly suitable for certain classes of castings.

A. E. Rhoads, Detroit Electric Furnace Co., Detroit, claimed the electric furnace the ideal medium for superheating metal and for the production of metal in which the operation must be controlled closely. He outlined typical specifications and how to obtain metal to meet them. The extra cost of operation of electric melting as compared with other processes is offset by the use of cheaper raw materials in many instances.

Don Reese, Whiting Corp., Chicago, described a recent installation in which a special low-carbon iron is obtained by a melting combination made up of a bessemer converter and a cupola. Part of the metal is blown down in the converter and then added to the regular iron in the ladle. The usual proportion is 40 per cent bessemer metal and 60 per cent iron.

## Factors in Maintenance of Plant Equipment Set Forth

PROBLEMS of maintenance of foundry equipment, involving the equipment manufacturer and the foundryman, provided a topic for an interesting discussion following the presentation of two papers at the session on materials handling at the foundrymen's convention in Philadelphia, Oct. 26.

R. J. Heisserman, Link-Belt Co., Philadelphia, elaborated upon the selection of foundry conveying equipment and outlined steps leading up to the selection of a continuous molding and pouring system, pointing out that when considering equipment of that type, a survey should be made to determine whether such a system would benefit the prospective purchaser. Outline of a prospective installation, both from the engineer's and the purchaser's standpoint, and a list of the various types of available equipment was given.

### Breakdowns Can Be Reduced

Plant maintenance consists of sustaining the plant and its equipment in good operating condition, according to James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind. Main functions of the maintenance department are to make emergency repairs; inspect equipment at regular intervals; follow the inspection with necessary repairs; keep adequate records of the inspection; suggest need of changes to engineering department; and to operate such service departments as may be assigned.

Breakdowns and necessary emergency repairs can be reduced by redesigning or improving machines. Periodic inspection and carefully kept records form the basis for constructive repair work and frequently also prevent breakdowns. The speaker pointed out that adequate operating and maintenance data should be provided by the equipment manufacturer. He suggested the standardization of material used, since that permits wide interchangeability of equipment and lowers the inventory of spare parts.

William M. Booth, Crouse Hinds Co., Syracuse, N. Y., in the discussion which followed, described the detailed studies which were made several years ago when the company was considering the installation of a mechanized foundry. He stated that it had been possible to operate the continuous unit during the depression with considerable success and that the application of continuous pouring had been of advantage to the company. The company produced an average of 20 tons a day when the system was installed, but during the depression it was operated on the basis of 10 tons. The company found that it could pour a casting at a cost of 1 cent a pound less on the conveyor than on the floor, and that the differential remained about the same during the past four years, providing overhead is not considered.

James A. Sweeney, Florence Pipe Foundry & Machine Co., Florence, N. J., raised a question as to whether crane operators should be under the maintenance department. Mr. Thomson stated that in his opinion less wear and tear on the crane equipment will be encountered if the crane operators are under the supervision and control of the maintenance department.

## Lubricating Grease Now Packed in Cartridges

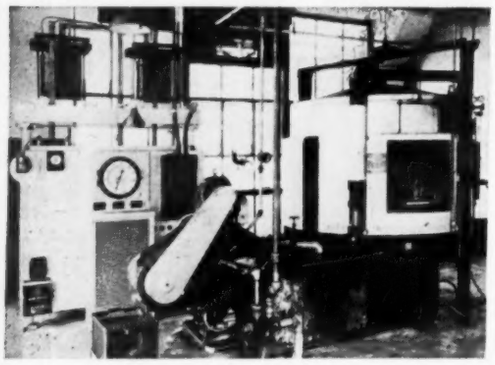
Greases packed in cartridge form to fit a new type of grease gun now are being sold by the Standard Oil Co. (Indiana), according to announcement by L. C. Welch, assistant general manager. To fill the new type of grease gun the operator merely slips a factory loaded cartridge into the barrel of the gun which is then ready for use.

The cartridges now being made are of 1-pound capacity and include several grades of lubricant. This method of handling works equally well with fluid gear lubricant or fairly stiff grease. A partially used cartridge quickly can be replaced with another cartridge of different grade of lubricant, and the lubricant in the used cartridge, being enclosed, is not wasted and likewise does not accumulate dirt.

This new, more convenient lubrication system has been perfected during the past few years by the Lubrication Corp., Chicago, a concern owned jointly by the Standard Oil Co. of Indiana and Bendix Aviation Corp. Each cartridge has a sliding bottom which acts as a plunger to feed the lubricant into the high pressure chamber in the nose of the gun. Although the cartridges cannot be refilled, they cost only slightly more than the same amount of grease packed in ordinary container. Cartridges of larger size may be offered in the near future, according to Mr. Welch's announcement.

# NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING



*Rotary hearth type furnace for heat treating small and medium size products. Electric Furnace Co. developed it*

**Rotary Hearth Type Furnace**—Electric Furnace Co., Salem, O., recently introduced a small rotary hearth type furnace for the economical heat treatment of miscellaneous lots of small and medium size products. The material is charged on to tilting trays by a sliding bottom loading pan, carried around the furnace on an alloy hearth, heated to the necessary temperature and dumped through a chute to the water or oil quench. With this furnace the handling of small lots of miscellaneous small and medium size products is placed on a continuous and economical basis.

This furnace is specially adapted for the handling of springs, bolts and miscellaneous screw machine products. The illustration shown above depicts the charging door of the furnace, quench tank, conveyor, recording controllers, etc. The transformers are shown above control panel.

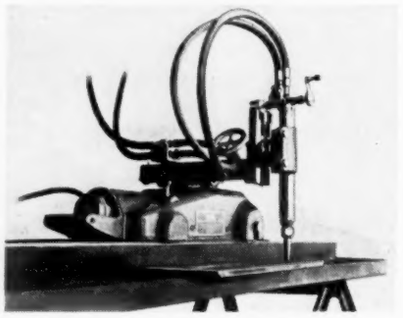
• • •

**Gas Cutting Machine**—Linde Air Products Co., 30 East Forty-second street, New York, has announced a new addition to its large line of oxyacetylene cutting machines, the "Oxweld Monitor" or CM-8 cutting machine. The unit is of extremely rugged construction.

The machine does automatic straight line cutting of practically unlimited length, straight bevel cutting, two bevels at a time if desired, plate edge preparation, circle or ring cutting of diameters up to 100 inches and the cutting of curved or irregular shapes. It should prove an indispensable tool for the metal industry.

One blowpipe, the Oxweld C-7, is supplied as standard equipment, thus permitting cuts up to 12 inches. The C-22 blowpipe may be substituted for heavier cutting and certain flame machining operations. Provision is made for the use of two blowpipes simultaneously. These can be mounted either on the same or opposite sides of the machine, and adjusted independently.

Special care has been given to speed control, and the sensitive indicators eliminate all guess work. Merely by setting the indicator and shifting the gear lever any speed may be instantly obtained within the range of 2 to 48 inches per minute. Location of the speed regulator near the guiding handle of the machine makes possible to alter the speed at an instant during cutting without stopping the work. The unit,



*Linde oxyacetylene cutting machine is portable and adjustable*

shown herewith, comes complete, ready to plug into the power line. It is supplied with blowpipe nozzles, two 6-foot lengths of track, etc.

• • •

**Wire Tying Machine**—Gerrard Co. Inc., Chicago, recently announced a new model semi-automatic machine designed for tying all types of corrugated, fiber and wooden shipping containers. Ties are made at a rate of 20 or more a minute. The machine which is portable and weighs 75 pounds, ties or knots the wire under the bundle and cuts it off in a manner that leaves no rough edges. Tension is adjustable to any size package or container. Bundles tied by this process are acceptable for United States mailing. The machine, shown herewith, is operated by a ½ horsepower motor and is ruggedly built with hardened steel gears, bronze worms, tool steel and malleable castings. It is mounted on a special steel table easily moved to the desired location.

*Wire tying machine has wide application. It is semi-automatic and is built by Gerrard Co. Inc.*

• • •

**Compact Circuit Breaker**—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently announced a new low voltage "De-ion" circuit breaker similar in general to the standard 600-ampere, 600-volt AB breaker brought out several years ago, with the major exception that the new breaker has an interrupting capacity of 20,000 amperes. The new unit is totally enclosed, being mounted in the standard 600-ampere molded case. It is available in all ratings from 50 to 600 amperes, complete with standard tripping accessories and motor mechanism.

• • •

**Bucket Trap**—Nason Mfg. Co., 71 Fulton street, New York, recently brought out a bucket trap which can be used at any point where a steam trap is required. It is made in four sizes for pressures up to 300 pounds per square inch and in two sizes for pressures up to 150 pounds per square inch. High capacity and compactness are obtained by use of a lever. This is placed in the top of the trap so the bearings always will be in clean water protected from wear by scale and grit.

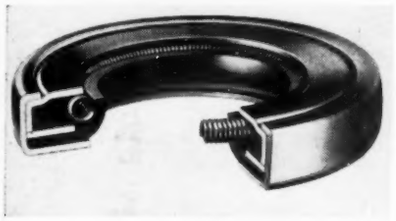
By means of lost motion between the valve and lever, sudden and complete opening, and quick and tight closing are obtained. Oil or grease floating on condensate does not affect

operation. The unit is quickly adaptable to different pressures by changing the seat only.

♦ ♦ ♦

**Oil and Grease Seal**—National Motor Bearing Co., Inc., 1213 Seventy-eighth avenue, Oakland, Calif., recently announced the development of a new oil and grease seal known as type BB. The unit, shown herewith, is for application to all types of machinery embodying shafts. It completely excludes extraneous matter and provides positive imprisonment of oil, grease and fluids. The seal consists of an outer steel case which locks the seal assembly permanently. The outer case has a press-fit accuracy of 0.002-inch tolerance, plus or minus on the diameter. An equalizing annular garter spring within the case provides a uniform continuous contact, pressing against the sealing member at all points circumferentially.

The actual sealing member contacting the moving shaft is made of

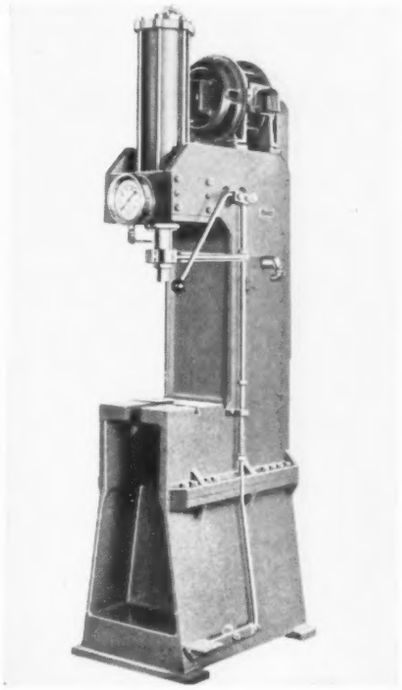


various materials, usually a processed leather, to suit different conditions such as temperature, peripheral speeds, unbalanced pressures and chemical activity. Applications of this new seal are indicated for all types of machinery, and particularly for motors, pumps, hoists, engines, excavating machinery, oil burners, agitators, special processing machinery, etc.

♦ ♦ ♦

**Forcing, Broaching Presses**—Logansport Machine Co., Logansport, Ind., recently brought out a new line of all steel electric welded hydraulic forcing and broaching presses ranging from ½ ton to 50 tons capacity. The small presses up to 5 tons capacity can be furnished for bench mounting. Oil reservoir for the hydraulic circuit is in the column of the press. Oil pump, valves, etc. are mounted on a panel attached to the column and are within the oil reservoir.

The hydraulic control valve is foot or hand-operated. When the operator steps on the foot pedal or pulls down the hand lever the ram makes its down travel. Automatic or manual reverse of ram is provided. Reverse of the ram can be made at any point of down stroke. When ram reaches



*Above—Logansport hydraulic forcing and broaching press*

*Left—National oil and grease seal*

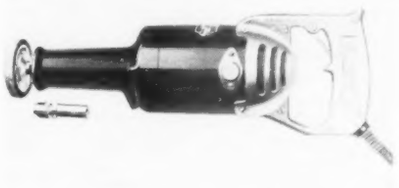
*Right—Barrett-Cravens tin plate elevator*

top position the pump bypasses and does not work against pressure. A stop rod is arranged on side of the press, shown above, with adjustable stops for regulating length of down travel and stop position of ram at top of stroke.

♦ ♦ ♦

**Hand Grinder**—Dumore Co., Racine, Wis., recently brought out a new hand grinder designed for production grinding of large and small dies, molds for cleaning up weld spots and similar work. The motor develops 1/5 horsepower and the tool weighs seven pounds.

A unique feature of the unit is an effective air filter which keeps all the grinding dust and dirt out of both motor and bearings. The filter is enclosed in the end cap and

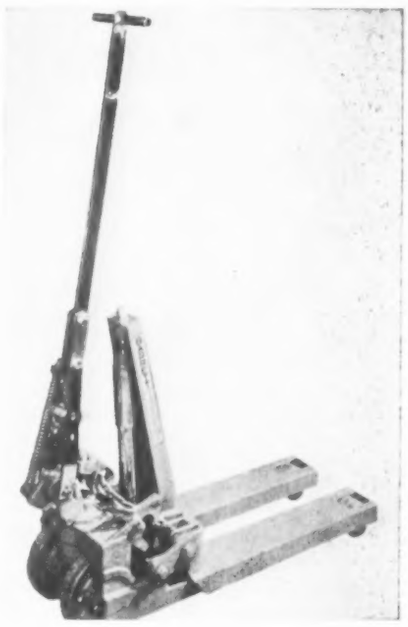


*New No. 9 Dumore hand grinder for production work*

can easily be removed, cleaned and replaced. A vacuum cleaner type of ventilating fan is employed which prevents heating even when the tool is used on production work. The tool operates at a speed of 14,250 revolutions per minute. It can be supplied with either a spade type of handle as shown in the illustration, or with a handle mounted on the side. The tool comes complete with wheel arbor, chuck for mounted wheels, small extension spindle and two grinding wheels.

♦ ♦ ♦

**Tin Plate Elevator**—Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, recently brought out a new tin plate elevator, shown herewith. This unit is designed specifically for



handling the new low 4-inch skids on which tin plate is being shipped. The truck in addition to having a single lift, compound lift and angle lift, is only 3½ inches high in the lowered position.

Width of the unit is 15 inches, with a carrying frame 24 inches long and a 5-inch clearance between the forks. It is capable of lifting loads of tin plate up to 3500 pounds in weight, a distance of 2¼ inches from the floor.

♦ ♦ ♦

**Rubber Tape**—B. F. Goodrich Co., Akron, O., is placing on the market a new type of rubber tape. This mending and electric tape is 90 per cent pure rubber and a single thickness has tested to 8000 volts, it is claimed. The new product has been tested and listed by the Underwriters' Laboratories and is expected to fulfill wide ranges of industrial uses.

## Gas Research Aims at Lower Costs, Improved Equipment

(*Concluded from Page* 64)

Bacon, Lone Star Gas Co., Dallas, Tex., attributed the most serious cases of corrosion to hydrogen sulphide. In their paper, they enumerated several ways in which internal corrosion by this cause may be eliminated or alleviated.

These methods are: (1) Protection of the pipe metal by applied coatings; (2) use of pipe metal alloys; (3) dehydration of the gas before entering the distribution system; (4) removal of oxygen from the gas; (5) removal of hydrogen sulphide from the gas; and (6) addition of inhibitors to the gas.

The use of protective coatings inside the pipe is receiving an increasing amount of attention, they declared, adding that an optical device has now been developed for complete inspection of the coating of the application in even small sized pipe. Cement has been used with some success in handling corrosive gases and liquids. A wide variety of protective films, such as lacquers, tars, greases, antioxidants and the like, are on the market, but have not been generally accepted by the gas industry, the authors asserted.

### Oil Film Reduces Corrosion

Application of an oil film by injecting a light oil into the compressor station discharge gases has reduced the rate of corrosion 75 per cent, in the experience of a West coast company, it was said. Glass and rubber lined pipe at present are too expensive to warrant their general use, but several of the new synthetic lacquers appear to have distinct possibilities, it was pointed out.

Use of corrosion-resisting alloys for pipe fabrication appears to be limited at present to the development of a reasonably priced pipe lined with a thin layer of a high-chrome stainless alloy. None of the less expensive alloys has sufficient resistance to hydrogen sulphide corrosion to warrant its use, the authors declared.

Dehydration of gas appears to be the most economical way of preventing internal corrosion, the authors stated, and may be applied most advantageously in the case of high-pressure systems, as the gas contains relatively little water and the load on the dehydrating system is much less than in the case of low pressure gas.

Where improved operating practice may substantially eliminate free oxygen in some systems, it cannot in others, the authors declared. It was their belief that an economical method for eliminating this element is yet to be developed. Relative to the removal of hydrogen sulphide, it was revealed that the Lone Star Gas Co. has developed a liquid scrubbing process which is proving satisfactory in many respects, with the use of stainless steel scrubbers suggested as a factor for reducing the cost of the operation. The addition of some chemical to inhibit the action of corrosive agents has received little attention from the gas industry to date, although there has been some interesting work in the use of inhibitors in other industries.

# New Trade Publications

WELDING—Hobart Bros. Co., Troy, O., has issued a booklet on 40-volt welding, containing much information on procedure in this type of welding.

LUBRICATION—Force feed lubricators manufactured by the Hills-McCanna Co., 2349 Nelson street, Chicago, are described in a current bulletin, with illustrations showing the devices and their operation.

PRESSURE REGULATORS—A booklet on pressure regulators and regulaton problems has been issued by the Air Reduction Sales Co., Lincoln building, New York. It describes means of accurate, uniform pressure control and close regulation of oxygen, acetylene and other gas pressures. Diagrams and charts illustrate the text.

ABRASIVES—A booklet by the Norton Co., Worcester, Mass., deals with the history and development of abrasives from earliest times, with particular attention to modern forms of artificial materials, silicon carbide and aluminous. Manufacturing methods and physical properties are described. Interesting illustrations dress the booklet.

PUMP—Worthington Pump & Machinery Corp., Harrison, N. J., in a current bulletin describes its horizontal duplex piston pumps for general purposes, valve plate type, for handling liquids at pressures up to 125 pounds per square inch. It is illustrated and tables give sizes, capacities and dimensions.

TESTING MACHINE—Carpenter torsion impact testing machine is the subject of bulletin No. 78 of the Baldwin-Southwark Corp., Southwark division, Philadelphia. The bulletin describes the machine, tells how it functions and shows by graphs some of the results found in tests of hardened steels. A bibliography on impact testing is appended.

CRANES—Harnischfeger Corp., Milwaukee, in celebration of its half-century of existence, has issued a book, "The Fiftieth Year." It tells of the growth of organization through many struggles and its development of equipment that has aided the industrial growth of the period. It is a contribution to the history of American industrial development.

LUBRICATION—Farval Corp., 3285 East Eightieth street, Cleveland, has published a booklet devoted to lubrication of steel plant machinery. It is bulletin No. 75. More of a demonstration book than a catalog, it presents for operating officials a series of illustrations showing typical modern steel plant equipment, in a succession that follows the course of production. Methods of lubrication are fully explained.

CARBON STEELS—A booklet entitled "Effects of McQuaid-Ehn Grain Size on the Structure and Properties of S. A. E. 1040 Steel," has been issued by the Carnegie Steel Co., Pittsburgh, in supplement to its former publication on Carnegie controlled carbon steels. It presents data to illustrate the widely different characteristics and properties of steels of inherently coarse and fine grain types.

DARK ROOM—Bausch & Lomb Optical Co., Rochester, N. Y., has prepared for distribution a poster containing suggested layouts for photomicrographic dark rooms from six feet square to 9 x 12 feet, showing arrangement of various details. Estimated cost for construction and for material are given. The poster is 9½ x 12 inches, with plans on one side and rules for the use of the room on the other.

HIGH TENSILE STEELS—A new group of high tensile steels produced by the subsidiaries of the United States Steel Corp. is described in literature being distributed by the advertising committee of these subsidiaries, Frick building, Pittsburgh. One is devoted to use of these steels in transport vehicles and another to advantages of their use from the viewpoint of fabrication in cars.

DRILL GRINDER—William Sellers & Co. Inc., Philadelphia, has issued a booklet listing and discussing common causes of high drilling costs. The various causes are listed and illustrations show the improper forms of drill points that reduce efficiency of the tool. The drill grinder designed to correct these faults is shown. Another bulletin describes the Sellers drill point, designed for efficient production.

WATER COLUMNS AND GAGES—Yarnall-Waring Co., Chestnut Hill, Philadelphia, has issued a catalog, No. WG-1803, on its line of hi-lo alarm water columns and vertical and inclined water level gages for boilers. These are built for pressures up to 1500 pounds. Construction and operating features are fully covered, with dimensions and weights. Illustrations show typical installations and a list of users is given.

ENAMELED IRON—Two pamphlets have been prepared by American Rolling Mill Co., Middletown, O., to aid in increasing use of its enameling iron. One is entitled "Facts You Should Know About Armco Enamelling Iron," designed to give information on the company's products to the enameler, fabricator and purchasing agent. The other is entitled, "How Porcelain Enamel Can Help You Sell More Profitably," designed to aid the job enameler and retail outlets.

# Long Pig Iron Decline Halted; Steel Rate 27

## Operations Cross Above 1933 Trend Line First Time Since June—Automotive Tonnage Improves—Scrap Strength Spreads—Iron Ore Producers Win Tax Case

HALTING a four-month steady decline in pig iron production, daily average output in October advanced 2.4 per cent to 30,695 gross tons, while the total for the month increased 5.8 per cent to 951,540 tons, with a net gain of four making 65 active blast furnaces.

This reflects heavier shipments, and more recently larger bookings of pig iron, some orders for 1000-ton lots being mainly traceable to the government's home modernization campaign. For 10 months this year output totals 13,991,954 tons, compared with 10,945,831 tons in the period last year.

Similarly, steel ingot production for October is expected to show an increase when figures become available this week. In advancing 1½ points to 27 per cent last week the steelworks rate made what might prove to be a more significant step.

All through the first half this year the rate was higher than in the first half last year. Beginning with July, the position was reversed, but now the rate again is above the corresponding period of 1933.

Ford, Chrysler and General Motors have placed larger preliminary orders for new models, so far without price concessions such as started buying by automobile manufacturers for third quarter. Ford, again approaching a new year declaring a determination to break the depression with a million-car output in 1935, is preparing to start assemblies this month.

### Government Seeking To Stimulate Demand for Materials; Structural Awards Lighter

In formulating its 2 to 12 billion dollar public works program for 1935 the government is placing less emphasis on common labor, and more on stimulating demand for materials and equipment. Some of the large public building projects have been delayed by bids exceeding estimates, or inability of general contractors to give bonds.

Structural shape awards for the week dropped to 7250 tons, half the amount placed in the preceding week. Following Chevrolet's example, Chrysler is planning a million-dollar assembly plant in Baltimore, which may require 5000 tons. Carnegie Steel Co.'s decision to build a continuous strip mill at its MacDonald, O., works means early fabrication of 3000 tons of shapes. The navy is inquiring for additional steel tonnage, and will take bids Nov. 16 on 4100 tons, mainly plates, for destroyer and submarine construction. Eastern oil interests are in the market for 4000 tons of plates for tanks.

Increasing attention is being given by the government and railroads to grade elimination. Chicago, North Shore & Milwaukee has been authorized to borrow $250,000 for such work, and to purchase rails. Illinois Central is expected to award a streamlined train and 11 diesel switching locomotives shortly. Mexican Railway Co. has ordered 30 all-steel box cars from a Pittsburgh builder.

Lake Superior iron ore producers, recently sued by Minnesota for delinquent taxes, have won an 18 per cent reduction.

### Ore Tax Reduction 18 Per Cent; Scrap Raises Iron, Steel Exports to New Peak

Improved financial conditions in South America, according to STEEL's London cablegram, are increasing exports of Welsh tin plate to that country. British tin plate production has been raised 70 per cent. French steelworks have revoked their decision to suspend for an indefinite period, in view of anticipated contracts from public relief projects.

American iron and steel exports in September, 301,330 tons, rose 44 per cent over August, and were the largest since the World war. Scrap represented 225,212 tons, 161,000 tons going to Japan. September imports, 23,847 tons, were 26 per cent less than in August. For nine months exports are up 143 per cent, imports down 21 per cent, compared with the first nine last year. Current export inquiry is featured by 4000 tons of sheets for Russia.

Steelworks operations at Chicago last week increased 2½ points to 30 per cent; Wheeling 2 to 31; Buffalo 2 to 26; Birmingham 15 to 25; eastern Pennsylvania ½-point to 20½; Youngstown 4 to 30. Cleveland held at 38; Detroit 59. Pittsburgh was off 2 to 19; New England 10 to 30.

STEEL's iron and steel composite is up 1 cent to $32.13, reflecting gains in scrap; the finished steel index remains $54; while scrap is up 12 cents to $9.66, highest since last week in August.

# COMPOSITE MARKET AVERAGES

| | Nov. 3 | Oct. 27 | One Month Ago Oct., 1934 | Three Months Ago Aug., 1934 | One Year Ago Nov., 1933 | Five Years Ago Nov., 1929 |
|---|---|---|---|---|---|---|
| Iron and Steel Composite | $32.13 | $32.12 | $32.10 | $32.24 | $30.25 | $35.60 |
| Finished Steel Composite | 54.00 | 54.00 | 54.00 | 54.00 | 49.20 | 56.48 |
| Steelworks Scrap Composite | 9.66 | 9.54 | 9.40 | 9.98 | 9.64 | 14.51 |

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

# A COMPARISON OF PRICES

**Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago**

| | Nov. 3, 1934 | Oct. 1934 | Aug. 1934 | Nov. 1933 |
|---|---|---|---|---|
| **Finished Material** | | | | |
| Steel bars, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.75 |
| Steel bars, Chicago | 1.85 | 1.85 | 1.85 | 1.80 |
| Steel bars, Philadelphia | 2.09 | 2.09 | 2.09 | 2.04 |
| Iron bars, Terre Haute, Ind. | 1.75 | 1.75 | 1.75 | 1.60 |
| Shapes, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.70 |
| Shapes, Philadelphia | 2.00½ | 2.00½ | 2.00½ | 1.90½ |
| Shapes, Chicago | 1.85 | 1.85 | 1.85 | 1.75 |
| Tank plates, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.70 |
| Tank plates, Philadelphia | 1.98½ | 1.98½ | 1.98½ | 1.88½ |
| Tank plates, Chicago | 1.85 | 1.85 | 1.85 | 1.75 |
| Sheets, No. 10, hot rolled, Pitts. | 1.85 | 1.85 | 1.85 | 1.75 |
| Sheets, No. 24, hot ann., Pitts. | 2.40 | 2.40 | 2.40 | 2.25 |
| Sheets, No. 24, galvan., Pitts. | 3.10 | 3.10 | 3.10 | 2.85 |
| Sheets, No. 10, hot rolled, Gary | 1.95 | 1.95 | 1.95 | 1.85 |
| Sheets, No. 24, hot anneal., Gary | 2.55 | 2.55 | 2.55 | 2.35 |
| Sheets, No. 24, galvan., Gary | 3.20 | 3.20 | 3.20 | 2.95 |
| Plain wire, Pittsburgh | 2.30 | 2.30 | 2.30 | 2.10 |
| Tin plate, per base box, Pitts. | 5.25 | 5.25 | 5.25 | 4.65 |
| Wire nails, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.10 |
| **Semifinished Material** | | | | |
| Sheet bars, open-hearth, Youngs. | $28.00 | 28.00 | 28.00 | 26.00 |
| Sheet bars, open-hearth, Pitts. | 28.00 | 28.00 | 28.00 | 26.00 |
| Billets, open-hearth, Pittsburgh | 27.00 | 27.00 | 27.00 | 26.00 |
| Wire rods, Pittsburgh | 38.00 | 38.00 | 38.00 | 35.00 |

| | Nov. 3, 1934 | Oct. 1934 | Aug. 1934 | Nov. 1933 |
|---|---|---|---|---|
| **Pig Iron** | | | | |
| Bessemer, del. Pittsburgh | 19.76 | 19.76 | 19.76 | 19.26 |
| Basic, Valley | 18.00 | 18.00 | 18.00 | 17.00 |
| Basic, eastern, del. eastern Pa. | 19.76 | 19.76 | 19.76 | 17.76 |
| No. 2 foundry, del. Pittsburgh | 19.26 | 19.26 | 19.26 | 18.76 |
| No. 2 foundry, Chicago | 18.50 | 18.50 | 18.50 | 17.50 |
| Southern No. 2, Birmingham | 14.50 | 14.50 | 14.50 | 13.50 |
| No. 2X eastern, del. Philadelphia | 20.63 | 20.63 | 20.63 | 18.63 |
| Malleable, Valley | 18.50 | 18.50 | 18.50 | 17.50 |
| Malleable, Chicago | 18.50 | 18.50 | 18.50 | 17.50 |
| Lake Superior charcoal, del. Chi. | 23.54 | 23.54 | 23.54 | 23.54 |
| Gray forge, del. Pittsburgh | 18.63 | 18.80 | 18.88 | 18.38 |
| Ferromanganese, del. Pittsburgh | 89.79 | 89.79 | 89.79 | 87.24 |
| **Scrap** | | | | |
| Heavy melting steel, Pittsburgh | $11.00 | 10.50 | 11.45 | 11.65 |
| Heavy melt. steel, No. 2, east. Pa. | 8.00 | 8.00 | 8.25 | 8.45 |
| Heavy melting steel, Chicago | 8.75 | 8.75 | 9.25 | 8.35 |
| Rails for rolling, Chicago | 10.25 | 9.90 | 10.50 | 10.25 |
| Railroad steel specialties, Chicago | 9.75 | 9.75 | 10.25 | 9.25 |
| **Coke** | | | | |
| Connellsville, furnace, ovens | 3.60 | 3.60 | 3.60 | 3.75 |
| Connellsville, foundry, ovens | 4.60 | 4.60 | 4.60 | 4.25 |
| Chicago, by-product foundry, del. | 9.25 | 9.25 | 9.25 | 9.25 |

# Steel, Iron, Raw Material and Metals Prices

*Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week*

## Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

| | |
|---|---|
| Pittsburgh, base | 1.85c |
| Gary, base | 1.95c |
| Chicago, del. | 1.98c |
| New York, del. | 2.18c |
| Philadelphia, del. | 2.14c |
| Birmingham, base | 2.00c |
| St. Louis, del. | 2.17c |
| F.o.b. cars, dock, Pacific ports | 2.40c |

HOT ROLLED ANN. No. 24

| | |
|---|---|
| Pittsburgh, base | 2.40c |
| Gary, base | 2.50c |
| Chicago, del. | 2.53c |
| Detroit, del. | 2.60c |
| New York, del. | 2.73c |
| Philadelphia, del. | 2.69c |
| Birmingham, base | 2.55c |
| St. Louis, del. | 2.72c |
| F.o.b. cars, dock, Pacific ports | 3.05c |

GALVANIZED No. 24

| | |
|---|---|
| Pittsburgh, base | 3.10c |
| Gary, base | 3.20c |
| Chicago, del. | 3.23c |
| Philadelphia, del. | 3.39c |
| New York, del. | 3.43c |
| Birmingham, base | 3.25c |
| St. Louis, del. | 3.42c |
| San Francisco, f.o.b. cars, dock | 3.70c |

TIN MILL BLACK No. 28

| | |
|---|---|
| Pittsburgh, base | 2.75c |
| Gary, base | 2.85c |
| St. Louis, del. | 3.07c |

COLD ROLLED No. 10

| | |
|---|---|
| Pittsburgh, base | 2.50c |
| Gary, base | 2.60c |
| Detroit, delivered | 2.70c |
| Philadelphia, del. | 2.79c |
| New York, del. | 2.83c |
| F.o.b. cars, dock, Pacific ports | 3.10c |

COLD ROLLED No. 20

| | |
|---|---|
| Pittsburgh, base | 2.95c |
| Gary, base | 3.05c |
| Detroit, delivered | 3.15c |
| Philadelphia, del. | 3.24c |
| New York, del. | 3.28c |

ENAMELING SHEETS

| | |
|---|---|
| Pittsburgh, No. 10 | 2.50c |
| Pittsburgh, No. 20 | 3.10c |

## Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

| | |
|---|---|
| Tin plate, coke base contract | $5.25 |
| Do., stock | $4.90 |
| Long ternes, No. 24 unassorted | 3.40c |

## Corrosion and Heat Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

| | No. 302 | No. 304 |
|---|---|---|
| Bars | 23.00 | 24.00 |
| Plates | 26.00 | 28.00 |
| Sheets | 33.00 | 35.00 |
| Hot strip | 20.75 | 22.75 |
| Cold strip | 27.00 | 29.00 |

Straight Chromes

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| Bars | 17.00 | 18.50 | 21.00 | 26.00 |
| Plates | 20.00 | 21.50 | 24.00 | 29.00 |
| Sheets | 25.00 | 28.00 | 31.00 | 35.00 |
| Hot strip | 15.75 | 16.75 | 21.75 | 26.75 |
| Cold strip | 20.50 | 22.00 | 27.00 | 35.00 |

## Steel Plates

| | |
|---|---|
| Pittsburgh, base | 1.80c |
| New York, del. | 2.08c |
| Philadelphia, del. | 1.98½c |
| Boston, del. | 2.20c |
| Buffalo, del. | 2.03½c |
| Chicago or Gary base | 1.85c |
| Cleveland, del. | 1.98½c |
| Birmingham, base | 1.95c |
| Coatesville, base | 1.90c |
| Sparrows Pt., base | 1.90c |
| Pacific Coast, f.o.b. cars, dock | 2.35c |
| St. Louis, del. | 2.07c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh, base | 1.80c |
| Philadelphia, del. | 2.00¼c |
| New York, del. | 2.05¼c |
| Boston, del. | 2.18½c |
| Bethlehem, base | 1.90c |
| Chicago, base | 1.85c |
| Cleveland, del. | 1.98½c |
| Buffalo, base | 1.90c |
| Gulf ports | 2.20c |
| Birmingham, base | 1.95c |
| Pacific Coast, f.o.b. cars, dock | 2.35c |

## Bars

SOFT STEEL

| | |
|---|---|
| Pittsburgh, base | 1.80c |
| Chicago or Gary | 1.85c |
| Duluth, base | 1.95c |
| Birmingham, base | 1.95c |
| Cleveland, base | 1.85c |
| Buffalo | 1.90c |
| Detroit, del. | 1.95c |
| Pacific Coast ports cars, dock, c.i.f. | 2.35c |
| Philadelphia, del. | 2.09c |
| Boston, del. | 2.20c |
| New York, del. | 2.13c |
| Pitts., forg. qual. | 1.95c-2.05c |

RAIL STEEL
To Manufacturing Trade

| | |
|---|---|
| Pittsburgh, base | 1.70c |
| Chicago or Gary, base | 1.75c |
| Moline, Ill., base | 1.75c |
| Cleveland, base | 1.75c |
| Buffalo, base | 1.80c |

IRON

| | |
|---|---|
| Terre Haute, Ind. | 1.75c |
| Chicago | 1.80c |
| Philadelphia, base | 1.89c |
| Pittsburgh, refined | 2.75c-7.50c |

REINFORCING

New billet, cut lengths, c. l.

| | |
|---|---|
| Pittsburgh | 2.05c |
| Chicago, Gary, Buffalo Cleve., Birm., Young | 2.10c |
| Gulf ports | 2.45c |
| Pacific coast ports f.o.b. cars dock | 2.45c |
| Philadelphia, del. | 2.34c |

Rail Steel

| | |
|---|---|
| Pittsburgh, base | 1.90c |
| Chicago, Buffalo, Cleveland, Birm., Young | 1.95c |
| Gulf ports | 2.30c |

## Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve., 100 lb. keg

| | |
|---|---|
| Standard wire nails | $2.60 |
| Cement coated nails | 2.60 |
| Galvanized nails, 15 gage and coarser | 4.60c |
| Do., 16 gage and finer | 5.10c |

(Per pound)

| | |
|---|---|
| Polished staples | 3.30c |
| Galvanized fence staples | 3.55c |
| Barbed wire, galv. | 3.00c |
| Annealed fence wire | 2.45c |
| Galvanized fence wire | 2.80c |
| Woven wire fencing (base column, c.l.) | $63.00 |
| Plain wire, 6-9 gage to mfg. trade | 2.30c |

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

| | |
|---|---|
| Spring wire, Pittsburgh or Cleveland | 2.90c |

Do., Chicago up $1, Worcester, $2.

## Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

| | |
|---|---|
| 10,000 to 19,999 lbs | 2.10c |
| 20,000 to 59,999 lbs. | 2.05c |
| 60,000 to 99,999 lbs. | 2.00c |
| 100,000 lbs. and over | 1.97½c |

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

## Alloy Steel Bars (Hot) □

| | |
|---|---|
| Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem | 2.45c |

| SAE | Alloy Diff. | SAE | Alloy Diff. |
|---|---|---|---|
| 2000 | 0.25 | 3100 | 0.55 |
| 2100 | 0.55 | 3200 | 1.35 |
| 2300 | 1.50 | 3300 | 3.80 |
| 2500 | 2.25 | 3400 | 3.20 |
| 4100 .15 to .25 Mo | | | 0.50 |
| 4600 .20 to .30 Mo. 125-1.75 Ni. | | | 1.05 |
| 5100 .80-1.10 Cr. | | | 0.45 |
| 5100 Cr. spring | | | base |
| 6100 bars | | | 1.20 |
| 6100 spring | | | 0.70 |
| Cr., Ni., Van. | | | 1.50 |
| Carbon Van. | | | 0.95 |
| 9250 Carbon base plus extras | | | |

## Piling □ □

| | |
|---|---|
| Pittsburgh | 2.15c |
| Chicago, Buffalo | 2.25c |

## Strip and Hoops □

Hot strip to 23⅞-in.

| | |
|---|---|
| Pittsburgh | 1.85c |
| Chicago, base | 1.95c |
| Birmingham, base | 2.00c |
| Detroit, delivered | 2.05c |
| Phila., delivered | 2.14c |
| New York, del. | 2.18c |
| Cooperage hoop, Pittsburgh | 1.95c |
| Chicago | 2.05c |
| Cold-rolled strip, Pitts., Cleve. | 2.60c |
| Worcester, Mass. | 2.80c |

## Rails, Track Material □

(Gross Tons)

| | |
|---|---|
| Standard rails, mill | $36.37½ |
| Relay rails, Pitts. 24-45 lbs. | $27.00 |
| 50-60 lbs. | $24.00 |
| 70-75 lbs. | $18.00 |
| 80-85 lbs. | $25.00 |
| 100 lbs. | $26.00 |
| Light rails, billet qual., Pittsb., Chi. | $35.00 |
| Do., reroll. qual. | $34.00 |
| Angle bars, mills | 2.55c |
| Spikes, R. R. base | 2.40c |
| Track bolts, base | 3.55c |
| Tie plates, base | 1.90c |

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

## Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

| | |
|---|---|
| All sizes, cut thrd. | 70-10-10-10 off |
| Rolled thread, ½ x 6 and smaller | 70-10-10-10 off |

MACHINE BOLTS

| | |
|---|---|
| All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts | 70-10-10-10 off |
| Tire bolts | 60-10-10 off |

Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.

| | |
|---|---|
| Rolled thread machine bolts, ½ x 6 and smaller | 70-10-10-10 off |
| Step bolts | 70-10-10-10 off |
| Elevator bolts | 70-10-10 off |

NUTS

| | |
|---|---|
| S.A.E. semifinished hex.; ½ to ⅞-inch. | 70-10-10-10 off |
| Do., ½ to 1-inch | 75 off |
| Do., over 1-inch | 70-10 off |

HEXAGON CAP SCREWS

| | |
|---|---|
| Milled | 85 off |
| Upset, 1-in., smaller | 85-10 off |

SQUARE HEAD SET SCREWS

| | |
|---|---|
| Upset, 1-in., small | 80 off |
| Headless set screws | 75-10 off |

## Rivets, Wrought Washers

| | |
|---|---|
| Struc., c. l., Pittsburgh, Cleveland | 2.90c |
| Struc., c. l., Chicago | 3.00c |
| ⅞-in. and smaller, Pitts., Chi., Cleve. | 70 and 5 off |
| Wrought washers, Pitts., Chi., Phila. | 6.00 off |

## Cut Nails □ □

| | |
|---|---|
| Cut nails, Pitts.; (10% discount on size extras) | $2.75 |
| Do. less carloads, 5 kegs or more no discount on size extras | $3.05 |
| Do. under 5 kegs; no discount on size extras | $3.20 |

## Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

## Welded Iron, Steel Pipe

Base discounts on steel pipe, [illegible] to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

| In. | Blk. | Gal. |
|---|---|---|
| ¼ and ⅜ | 53½ | 35 |
| ½ | 58½ | 47 |
| ¾ | 62 | 52 |
| 1—3 | 64 | 55 |

Iron

| | | |
|---|---|---|
| ½ | 31½ | 15 |
| ¾ | 36½ | 20½ |
| 1—1¼ | 39½ | 26½ |
| 2 | 41½ | 26 |

LAP WELD

Steel

| | | |
|---|---|---|
| 2 | 60 | 51 |
| 2½—3 | 63 | 54 |
| 3½—6 | 65 | 56 |
| 7 and 8 | 64 | 54 |
| 9 and 10 | 63½ | 53½ |

Iron

| | | |
|---|---|---|
| 2 | 37 | 22½ |
| 2½—3½ | 38 | 25 |
| 4—8 | 40 | 28½ |

LINE PIPE

Steel

| | |
|---|---|
| ½, butt weld | 57½ |
| ⅛-inch, but weld | 50½ |
| ¼—⅜, buttweld | 52½ |
| ¾, butt weld | 61 |
| 1—3, butt weld | 63 |
| 2-inch, lap weld | 59 |
| 2½—3, lap weld | 62 |
| 3½—6, lap weld | 64 |
| 7—8, lap weld | 63 |

Iron

⅛—1½-inch, black and galv. take 4 pts., over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

*C. L. Discounts, f.o.b. Pitts.*

| *Lap Weld Steel* | | *Charcoal Iron* | |
|---|---|---|---|
| 2—2¼ | 33 | 1¾ | 8 |
| 2½—2¾ | 40 | 2—2¼ | 13 |
| 3 | 47 | 2½—2¾ | 16 |
| 3¼—3½ | 50 | 3 | 17 |
| 4 | 52 | 3¾—3½ | 18 |
| 4½—5 | 42 | 4 | 20 |
| | | 4½ | 21 |

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron; 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

## Seamless Tubing □

*Cold drawn; f.o.b. mill disc.*

| | |
|---|---|
| 100 ft. or 150 lbs. | 32% |
| 15,000 ft. or 22,500 lbs. | 70% |

## Cast Iron Water Pipe □

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in. & over, Birm. | $38.00-39.00 |
| 4-in., Birmingham | 41.00-42.00 |
| 4-in., Chicago | 49.00-50.00 |
| 6 to 24-in., Chicago | 46.00-47.00 |
| 3-in & over, east fdy | 42.00 |
| Do., 4-in. | 45.00 |

Class A pipe $2 over Class B. Stnd fittgs., Birm. base $100.00

## Semifinished Steel □

BILLETS AND BLOOMS

*4 x 4-inch base; gross ton*

| | |
|---|---|
| Pitts., Chi., Cleve., and Youngstown | $27.00 |
| Philadelphia | 32.30 |
| Duluth | 31.00 |
| Forging, Pitts., Chi. and Buffalo | 32.00 |
| Forging, Duluth | 36.00 |

SHEET BARS

| | |
|---|---|
| Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md., | 28.00 |

SLABS

| | |
|---|---|
| Pitts., Cleve., Young. | 27.00 |

WIRE RODS

| | |
|---|---|
| Pitts., Cleveland | 38.00 |
| Chicago | 39.00 |
| Worcester, Mass. | 40.00 |

SKELP

| | |
|---|---|
| Pitts., Chicago | 1.70c |

## Coke □ □ □

*Price Per Net Ton*

BEEHIVE OVENS

| | |
|---|---|
| Connellsville, fur | $3.60- 3.85 |
| Connellsville, fdry. | 4.60 |
| Connell. prem. fdy. | 5.10 |
| New River fdry | 6.00 |
| Wise county fdry. | 4.45- 5.25 |
| Wise county fur. | 4.00- 4.50 |

BY-PRODUCT FOUNDRY

| | |
|---|---|
| Newark, N. J., del. | 8.71- 9.31 |
| Chi., ov., outside del. | 8.50 |
| Chicago, del | 9.25 |
| New England, Del. | 10.50 |
| St. Louis, del. | 9.25 |
| Birmingham, ovens | 6.00 |
| Indianapolis, del. | 8.75 |
| Cincinnati, del. | 9.30 |
| Cleveland, del. | 9.25 |
| Buffalo, ovens | 7.50- 8.00 |
| Detroit, ovens | 8.50 |
| Philadelphia, del. | 9.00 |

## Coke By-Products □

Per gallon, producers' plants. Tank lots

| | Spot |
|---|---|
| Pure benzol | 19.00c |
| 90 per cent benzol | 19.00c |
| Toluol | 30.00c |
| Solvent naphtha | 26.00c |
| Commercial xylol | 26.00c |

Per lb. f.o.b. New York

| | |
|---|---|
| Phenol (200 lb drums) | 16.30c |
| Do. (100 lbs.) | 17.30c |

Eastern Plants, per lb.

| | |
|---|---|
| †Naphthalene flakes and balls, in bbl. | 6.00c |

Per 100 lb. Atlantic seaboard

| | |
|---|---|
| Sulphate of ammonia | $1.20 |

†Western prices ½-cent up

## Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25; 50-cent differentials apply to any grade below 1.75. Gross tons.

| BASING POINTS: | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Bethlehem Pa. | $19.50 | $20.00 | $19.00 | $20.50 |
| Birdsboro, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Birmingham, Ala., southern del. | 14.50 | ..... | 13.50 | 19.00 |
| Buffalo | 18.50 | 19.00 | 17.50 | 19.50 |
| Chicago | 18.50 | 18.50 | 18.00 | 19.00 |
| Cleveland | 18.50 | 18.50 | 18.00 | 19.00 |
| Detroit | 18.50 | 18.50 | 18.00 | 19.00 |
| Duluth | 19.00 | 19.00 | ..... | 19.50 |
| Erie, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Everett, Mass. | 19.50 | 20.00 | 19.00 | 20.50 |
| Granite City, Ill. | 18.50 | 18.50 | 18.00 | ..... |
| Hamilton, O. | 18.50 | 18.50 | 18.00 | 19.00 |
| Jackson, O. | 20.25 | 20.25 | 19.75 | ..... |
| Neville Island, Pa. | 18.50 | 18.50 | 18.00 | 19.00 |
| Provo, Utah | 17.50 | ..... | 17.00 | ..... |
| Sharpsville, Pa. | 18.50 | 18.50 | 18.00 | 19.00 |
| Sparrows Point, Md. | 19.50 | ..... | 19.00 | ..... |
| Swedeland, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Toledo, O. | 18.50 | 18.50 | 18.00 | 19.00 |
| Youngstown, O. | 18.50 | 18.50 | 18.00 | 19.00 |
| DELIVERED FROM BASING POINTS: | | | | |
| Akron, O., from Cleveland | 19.76 | 19.76 | 19.26 | 20.26 |
| Baltimore from Birmingham | 20.02 | ..... | 19.90 | ..... |
| Boston from Birmingham | 19.62 | ..... | 19.50 | ..... |
| Boston from Everett, Mass. | 20.00 | 20.50 | 19.50 | 21.00 |
| Boston from Buffalo | 20.00 | 20.50 | 19.50 | 21.00 |
| Brooklyn, N. Y., from Bethlehem | 21.77 | 22.27 | ..... | ..... |
| Brooklyn, N. Y., from Bmghm. | 21.39 | ..... | ..... | ..... |
| Canton, O., from Cleveland | 19.76 | 19.76 | 19.26 | 20.26 |
| Chicago from Birmingham | †18.72 | ..... | 18.60 | ..... |
| Cincinnati from Hamilton, O. | 19.51 | 19.51 | 19.01 | ..... |
| Cincinnati from Birmingham | 19.13 | ..... | 19.01 | ..... |
| Cleveland from Birmingham | 18.62 | ..... | 18.50 | ..... |
| Indianapolis from Hamilton, O. | 20.77 | 20.77 | 20.27 | 21.27 |
| Mansfield, O., from Toledo, O. | 20.26 | 20.26 | 19.76 | 20.76 |
| Milwaukee from Chicago | 19.50 | 19.50 | 19.00 | 20.00 |
| Muskegon, Mich., from Chicago, Toledo or Detroit | 21.40 | 21.40 | 20.90 | 21.90 |
| Newark, N. J., from Birmingham | 20.51 | ..... | ..... | ..... |
| Newark, N. J., from Bethlehem | 20.89 | 21.39 | ..... | ..... |
| Philadelphia from Birmingham | 19.88 | ..... | 19.76 | ..... |
| Philadelphia from Swedeland, Pa. | 20.26 | 20.76 | 19.76 | ..... |
| Pittsburgh district from Neville Island | (Neville Island base, plus 63c, 76c and $1.13 switching chgs.) | | | |
| Saginaw, Mich., from Detroit | 20.60 | 20.60 | 20.10 | 21.10 |
| St. Louis from Granite City, Ill. | 19.00 | 19.00 | 18.50 | ..... |
| St. Louis from Birmingham | 18.62 | ..... | 18.50 | ..... |
| St. Paul from Duluth | 20.94 | 20.94 | ..... | 21.44 |

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50

†Off grade material is $19.50

Philadelphia, standard and copper bearing ..... 24.63

| GRAY FORGE | | CHARCOAL | |
|---|---|---|---|
| Valley furnace | 18.00 | Lake Superior fur. | 21.00 |
| Pitts. dist. fur. | 18.00 | Do., del. Chicago | 24.04 |

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

## Iron Ore □ □

LAKE SUPERIOR ORE

*Gross ton, 51½% Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $4.80 |
| Mesabi nonbess. | 4.50 |
| High phosphorus | 4.40 |
| Mesabi bessemer | 4.65 |
| Old range nonbess. | 4.65 |

EASTERN LOCAL ORES

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56-63% con. (nom.) | 8.00- 9.00 |
| Cop.-free low phos. 58-60% (nom.) | 10.00-10.50 |

FOREIGN ORE

*Cents per unit, f.a.s. Atlantic ports (nominal)*

| | |
|---|---|
| Foreign manganiferous ore, 45.55% iron, 6-10% man. | 10.00 |
| No. Afr. & low phos. | 9.50 |
| Swedish basic, 65% | 9.00 |
| Swedish low phos. | 9.50 |
| Spanish No. Africa basic, 50 to 60% | 9.00 |
| Tungsten, spot, sh. ton unit, duty pd. | $17.75-18.25 |
| N. F. fdy., 55% | 7.00 |
| Chrome ore, 48% gross ton, c.i.f. | $18.00 |

## Manganese Ore □

*(Nominal)*

Prices, not including duty, cents per unit, cargo lots.

| | |
|---|---|
| Caucasian, 52-55% | 26.00 |
| So. African, 52% | 26.00 |
| So. Afr., 49-51% | 24.00 |
| Indian, 58-50% | nominal |
| Indian, 48-50% | nominal |

## Refractories □ □

*Per 1000 f.o.b. Works*

FIRE CLAY BRICK

*First Quality*

| | |
|---|---|
| Pa., Ill., Ky., Md., Ga., Mo. | $45.00 |
| Alabama | 45.00 |

*Second Quality*

| | |
|---|---|
| Pa., Ill., Ky., Md., Mo., Ga., Ala. | 40.00 |

*Ohio*

| | |
|---|---|
| First quality | $40.00 |
| Intermediary | 36.00 |
| Second quality | 25.00 |

| | |
|---|---|
| MALLEABLE BUNG BRICK All bases | 50.00 |

SILICA BRICK

| | |
|---|---|
| Pennsylvania | $45.00 |
| Joliet, E. Chicago | 54.00 |
| Birmingham, Ala. | 52.00 |

MAGNESITE

| | |
|---|---|
| Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases | $45.00 |
| Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases | 40.00 |
| Domestic dead-burned grains, net ton f.o.b Chewelah, Wash. | 22.00 |

BASIC BRICK

*Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.*

| | |
|---|---|
| Magnesite brick | $65.00 |
| Chrome brick | 45.00 |
| Chemically bonded magnesite | 55.00 |

## Fluorspar, 85-5 □ □

| | |
|---|---|
| Washed gravel, duty paid, tide, net ton | $19.50 |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads | $15.50-16.00 |

## Ferroalloys □ □

*Dollars, except Ferrochrome*

| | |
|---|---|
| Ferromanganese, 78-82% tidewater, duty paid | 85.00 |
| Do., Balti. base | 85.00 |
| Do., del. Pittsburgh | 89.79 |
| Spiegeleisen, 19-20% dom. fur. spot† | 26.00 |
| Ferrosilicon 50%, freight all., cl. | 77.50 |
| Do., less carload | 85.00 |
| Do., 75 per cent | 126-130.00 |

Spot, $5 a ton higher.

| | |
|---|---|
| Silicomang., 2½ carb. 2% carbon, 95.00; 1%, | 90.00 105.00 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del. | 10.00 |
| Ferrotungsten, stand., lb. cont. del. | 1.35- 1.45 |
| Ferrovanadium, 35 to 40% lb., cont., on analysis | 2.70- 2.90 |
| Ferrotitanium, c. l., prod. plant, frt. allow., net ton | 137.50 |
| Spot, 1 ton, frt. allow., lb. | 7.00 |
| Do., under 1 ton | 7.50 |
| Ferrophosphorus, per ton, c. l., 17-19%. Rockdale Tenn., basis, 18%, $2 unitage | 42.00 |
| Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage | 55.00 |
| Ferromolybdenum, stand. 50-60%, lb. | 0.95 |
| Molybdate, lb. cont. | 0.80 |

†Carloads, Quan. diff. apply.

## Nonferrous Mill Products

*F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper*

| | |
|---|---|
| **Sheets** | |
| Yellow brass (high) | 14.50 |
| Copper, hot rolled | 16.00 |
| Lead, cut, to jobbers | 7.50 |
| Zinc, 100-lb. base | 9.50 |
| **Tubes and Pipes** | |
| High yellow brass | 17.00 |
| Seamless copper | 17.25 |
| **Rods** | |
| High yellow brass | 13.00 |
| Copper, hot rolled | 13.25 |
| **Anodes** | |
| Copper untrimmed | 13.75 |
| **Wire** | |
| Yellow brass (high) | 15.00 |

## Old Metals □ □

*Deal, buying prices, cents lb.*

| | |
|---|---|
| **No. 1 Composition Red Brass** | |
| New York | 4.25- 4.50 |
| *Chicago | 4.25- 4.50 |
| Cleveland | 4.75- 5.00 |
| St. Louis | 4.00- 4.25 |
| **Heavy Copper and Wire** | |
| New York | 5.50- 5.75 |
| *Chicago, No. 1 | 5.50- 5.75 |
| Cleveland | 5.25- 5.37½ |
| St. Louis | 4.75- 5.00 |
| **Composition Brass Borings** | |
| New York | 3.87½-4.12½ |
| **Light Copper** | |
| *New York | 4.50- 4.75 |
| *Chicago | 4.12½- 4.37½ |
| Cleveland | 4.25- 4.75 |
| St. Louis | 4.00- 4.25 |
| **Light Brass** | |
| *Chicago | 2.12½- 2.37½ |
| Cleveland | 2.50- 2.75 |
| **Lead** | |
| New York | 2.75- 3.00 |
| Cleveland | 2.75- 2.90 |
| Chicago | 2.75- 3.00 |
| St. Louis | 2.75- 2.85 |
| **Zinc** | |
| New York | 1.75- 2.00 |
| Cleveland | 1.75- 1.85 |
| St. Louis | 2.50- 2.60 |
| **Aluminum** | |
| Borings, Cleveland | 6.00- 7.00 |
| Mixed, cast, Cleve. | 10.25-11.00 |
| Mixed, cast, St. L. | 10.25-10.50 |
| Clips, soft, Cleve. | 12.00-13.00 |

## Secondary Metals □

| | |
|---|---|
| Brass ingot, 85-5-5-5 | 8.25 |
| Stand. No. 12 Alum. | 14.00 |

# Iron and Steel Scrap Prices

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated*

| | |
|---|---|
| **HEAVY MELTING STEEL** | |
| Birmingham | 8.00- 8.50 |
| Boston, dealers | 5.00- 5.25 |
| Buffalo, No. 1 | 9.50-10.00 |
| Buffalo, No. 2 | 8.50- 9.00 |
| Chicago, No. 1 | 8.50- 9.00 |
| Cleveland, No. 1 | 8.00- 8.50 |
| Cleveland, No. 2 | 7.50- 8.00 |
| Detroit, No. 1 | 7.75- 8.25 |
| Detroit, No. 2 | 6.75- 7.25 |
| Eastern Pa. | 9.75-10.00 |
| Eastern Pa., No. 2 | 8.00- 8.50 |
| Federal, Ill. | 7.00- 7.50 |
| Granite City, R. R. | 6.50- 7.00 |
| Granite City, No. 2 | 6.00- 6.50 |
| N. Y., deal. R. R. | 8.00 |
| N. Y., deal. No. 2 | 6.50 |
| Pittsburgh, No. 1 | 10.75-11.25 |
| St. Louis | 6.50- 7.00 |
| Valleys, No. 1 | 10.50 |
| **COMPRESSED SHEETS** | |
| Buffalo, dealers | 8.50- 9.00 |
| Chicago, factory | 7.50- 8.00 |
| Cleveland | 7.00- 7.50 |
| Detroit | 7.75- 8.25 |
| E. Pa., new mat. | 9.50-10.00 |
| Pittsburgh | 10.75-11.25 |
| St. Louis | 5.00- 5.50 |
| Valleys | 10.00 |
| **BUNDLED SHEETS** | |
| Buffalo | 6.50- 7.00 |
| Cincinnati, del. | 6.00- 6.50 |
| Cleveland | 6.50- 7.00 |
| Pittsburgh | 9.00- 9.50 |
| St. Louis | 4.00- 4.25 |
| **SHEET CLIPPINGS, LOOSE** | |
| Chicago | 4.00- 4.50 |
| Cincinnati | 4.50- 5.00 |
| Detroit | 4.50- 5.00 |
| St. Louis | 3.50- 4.00 |
| **STEEL RAILS, SHORT** | |
| Birmingham | 10.00-10.50 |
| Buffalo | 11.50-12.00 |
| Chicago (3 ft.) | 10.50-11.00 |
| Chicago (2 ft.) | 11.50-12.00 |
| Cincinnati, del. | 9.75-10.25 |
| Detroit | 10.50-11.00 |
| Pitts., open-hearth, 3 ft. and less | 13.50-14.00 |
| St. Louis, 2 ft. & less | 10.00-10.50 |
| **STEEL RAILS, SCRAP** | |
| Boston | 5.00- 5.25 |
| Chicago | 8.50- 9.00 |
| Pittsburgh | 10.00-10.50 |
| **STOVE PLATE** | |
| Birmingham | 5.50- 6.00 |
| Boston, dealers | 3.25- 3.75 |
| Buffalo | 8.50- 9.00 |
| Chicago, net | 5.50- 6.00 |
| Cincinnati, dealers | 5.00- 5.50 |
| Detroit, net | 6.00- 6.50 |
| Eastern Pa. | 8.50 |
| N. Y., deal. fdry. | 6.00 |
| St. Louis | 5.00- 5.50 |
| **COUPLERS, SPRINGS** | |
| Buffalo | 12.00-12.50 |
| Chicago, springs | 9.50-10.00 |
| Eastern Pa. | 12.50-13.00 |
| Pittsburgh | 13.50-14.00 |
| St. Louis | 8.00- 8.50 |

| | |
|---|---|
| **ANGLE BARS—STEEL** | |
| Chicago | 9.00- 9.50 |
| St. Louis | 7.50- 8.00 |
| **RAILROAD SPECIALTIES** | |
| Chicago | 9.50-10.00 |
| **LOW PHOSPHORUS** | |
| Buffalo, billets and bloom crops | 11.50-12.00 |
| Cleveland, billet, bloom crops | 13.00-13.50 |
| Eastern Pa., crops | 13.50-14.00 |
| Pittsburgh, billet, bloom crops | 13.50-14.00 |
| Pittsburgh, sheet bar crops | 13.00-13.50 |
| **FROGS, SWITCHES** | |
| Chicago | 8.50- 9.00 |
| St. Louis, cut | 8.50- 9.00 |
| **SHOVELING STEEL** | |
| Chicago | 8.50- 9.00 |
| Federal, Ill. | 6.75- 7.00 |
| Granite City, Ill. | 6.00- 6.50 |
| **RAILROAD WROUGHT** | |
| Birmingham | 7.00- 7.50 |
| Boston, dealers | 6.00- 6.50 |
| Buffalo, No. 1 | 7.50- 8.00 |
| Buffalo, No. 2 | 9.50-10.00 |
| Chicago, No. 1, net | 7.00- 7.50 |
| Chicago, No. 2 | 8.50- 9.00 |
| Cincinnati, No. 2 | 7.00- 7.50 |
| Eastern Pa. | 10.50 |
| N. Y., No. 1, deal. | 7.00- 7.50 |
| St. Louis, No. 1 | 5.75- 6.25 |
| St. Louis, No. 2 | 6.75- 7.25 |
| **SPECIFICATION PIPE** | |
| Boston | 3.00- 3.25 |
| Eastern Pa. | 8.00 |
| New York, dealers | 3.50- 4.00 |
| **BUSHELING** | |
| Buffalo, No. 1 | 8.50- 9.00 |
| Chicago, No. 1 | 7.00- 7.50 |
| Cinci., No. 1, deal. | 5.50- 6.00 |
| Cincinnati, No. 2 | 3.50- 4.00 |
| Cleveland, No. 2 | 6.50- 7.00 |
| Detroit, No. 1, new | 6.75- 7.25 |
| Valleys, new No. 1 | 9.75 |
| **MACHINE TURNINGS** | |
| Birmingham | 4.50- 5.00 |
| Boston, dealers | 1.25 |
| Buffalo | 4.75- 5.25 |
| Chicago | 4.50- 5.00 |
| Cincinnati, dealers | 4.00- 4.50 |
| Cleveland | 6.00- 6.50 |
| Detroit | 4.50- 5.00 |
| Eastern Pa. | 5.50 |
| New York, dealers | 1.75- 2.00 |
| Pittsburgh | 7.00- 7.50 |
| St. Louis | 3.00- 3.50 |
| Valleys | 8.00- 8.25 |
| **BORINGS AND TURNINGS** | |
| *For Blast Furnace Use* | |
| Boston, dealers | 3.25- 3.50 |
| Buffalo | 5.50- 6.00 |
| Cincinnati, dealers | 4.00- 4.50 |
| Cleveland | 6.50- 7.00 |
| Detroit | 5.75- 6.25 |

| | |
|---|---|
| Eastern Pa. | 5.00 |
| New York, dealers | 1.50- 1.75 |
| Pittsburgh | 5.50- 6.00 |
| **CAST IRON BORINGS** | |
| Birmingham, plain | 4.50- 5.00 |
| Boston, chemical | 8.50- 9.00 |
| Boston, dealers | 3.25- 3.50 |
| Buffalo | 5.50- 6.00 |
| Chicago | 4.50- 5.00 |
| Cincinnati, dealers | 4.00- 4.50 |
| Cleveland | 6.75- 7.25 |
| Detroit | 5.75- 6.25 |
| E. Pa., chemical | 12.00-13.00 |
| New York, dealers | 1.50- 1.75 |
| Pittsburgh | 5.50- 6.00 |
| St. Louis | 3.00- 3.50 |
| **PIPE AND FLUES** | |
| Cincinnati, dealers | 4.00- 4.50 |
| **RAILROAD GRATE BARS** | |
| Buffalo | 6.50- 7.00 |
| Chicago, net | 5.00- 5.50 |
| Cincinnati | 4.00- 4.50 |
| Eastern Pa. | 8.00- 8.50 |
| New York, dealers | 4.00- 4.50 |
| St. Louis | 4.00- 4.50 |
| **FORGE FLASHINGS** | |
| Boston, dealers | 3.75- 4.00 |
| Buffalo | 8.50- 9.00 |
| Cleveland | 7.00- 7.50 |
| Detroit | 6.25- 6.75 |
| **FORGE SCRAP** | |
| Boston, dealers | 3.75 |
| Chicago, heavy | 9.50-10.00 |
| Eastern Pa. | 9.00 |
| **ARCH BARS, TRANSOMS** | |
| St. Louis | 10.00-10.50 |
| **AXLE TURNINGS** | |
| Boston, dealers | 3.00- 3.50 |
| Buffalo | 7.00- 7.50 |
| Chicago, elec. fur. | 7.50- 8.00 |
| Cleveland | 6.00- 6.50 |
| Eastern Pa. | 9.00- 9.50 |
| St. Louis | 6.00- 6.25 |
| **STEEL CAR AXLES** | |
| Birmingham | 10.00-10.50 |
| Boston, ship. point. | 10.00-10.50 |
| Buffalo | 12.00-12.50 |
| Chicago, net | 10.00-10.50 |
| Eastern Pa. | 14.00-15.00 |
| St. Louis | 10.00-10.50 |
| **SHAFTING** | |
| Boston, ship. point. | 10.50-11.00 |
| Eastern Pa. | 16.00 |
| New York, dealers | 10.75-11.25 |
| St. Louis | 11.00-11.50 |
| **CAR WHEELS** | |
| Birmingham, iron | 9.00- 9.50 |
| Boston, iron deal. | 5.00- 5.50 |
| Buffalo, iron | 11.00-11.50 |
| Buffalo, steel | 12.00-12.50 |
| Chicago, iron | 9.50-10.00 |

| | |
|---|---|
| Chicago, rolled steel | 9.50-10.00 |
| Cincinnati, iron | 7.50- 8.00 |
| Eastern Pa., iron | 10.50-11.00 |
| Eastern Pa., steel | 12.50-13.00 |
| Pittsburgh, iron | 10.00-10.50 |
| Pittsburgh, steel | 13.50-14.00 |
| St. Louis, iron | 7.25- 7.75 |
| St. Louis, steel | 8.75- 9.25 |
| **NO. 1 CAST SCRAP** | |
| Birmingham | 8.50- 9.00 |
| Boston, No. 2 | 6.00 |
| Boston, tex. con. | 8.50- 9.00 |
| Buffalo, cupola | 9.50-10.00 |
| Buffalo, mach. | 10.50-11.00 |
| Chicago, agri. net | 7.50- 8.00 |
| Chicago, mach. net | 8.50- 9.00 |
| Chicago railroad net | 8.00- 8.50 |
| Cinci., mach. cup | 8.50- 9.00 |
| Cleveland, cupola | 10.75-11.25 |
| Detroit, net | 8.50- 9.00 |
| Eastern Pa., cupola | 11.00 |
| Pittsburgh, cupola | 12.00-12.50 |
| San Francisco, del. | 13.50-14.00 |
| Seattle | 7.00- 8.50 |
| St. Louis, No. 1 | 6.50- 7.00 |
| St. L., No. 1 mach. | 8.50- 9.00 |
| **HEAVY CAST** | |
| Boston, del. | 4.50- 4.75 |
| Buffalo, break. | 7.75- 8.25 |
| Cleveland, break. | 7.50- 8.00 |
| Detroit, break. | 6.50- 7.00 |
| Detroit, auto net | 9.00- 9.50 |
| Eastern Pa. | 9.50-10.00 |
| N. Y., break. deal. | 5.25- 5.75 |
| Pittsburgh | 10.00-10.50 |
| **MALLEABLE** | |
| Boston, consum. | 10.00-10.50 |
| Buffalo | 10.50-11.00 |
| Chicago, R. R. | 10.00-10.50 |
| Cincinnati, agri. del. | 7.50- 8.00 |
| Cleveland, rail | 10.75-11.25 |
| Detroit, auto | 8.75- 9.25 |
| St. Louis, R. R. | 7.00- 7.50 |
| Eastern Pa., R. R. | 10.50-11.00 |
| **RAILS FOR ROLLING** | |
| *5 feet and over* | |
| Birmingham | 9.50-10.00 |
| Boston, dealers | 8.00- 8.50 |
| Buffalo | 10.25-10.75 |
| Chicago | 10.00-10.50 |
| Eastern Pa. | 12.00-12.50 |
| New York, dealer | 7.50- 8.00 |
| St. Louis | 9.00- 9.50 |
| **LOCOMOTIVE TIRES** | |
| Chicago (cut) | 9.00- 9.50 |
| St. Louis, No. 1 | 9.50-10.00 |
| **LOW PHOS. PUNCHINGS** | |
| Buffalo | 12.00-12.50 |
| Chicago | 11.00-11.50 |
| Eastern Pa. | 14.50-15.00 |
| Pittsburgh | 12.50-13.00 |

# Nonferrous Metal Prices of the Week

*Spot unless otherwise specified. Cents per pound*

| | Copper | | | Straits Tin | | Lead | Lead | Zinc | Aluminum | Antimony | Nickel |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Electro., del. Conn. | Lake, del. Midwest | Casting, refinery | New York Spot | New York Futures | N. Y. | East St. L. | St. L. | 99% | Spot, N. Y. | Cathodes |
| Oct. 27 | 9.00 | 9.12½ | 7.50 | 51.05 | 51.10 | 3.70 | 3.55 | 3.82½ | *19.00 | 9.50 | 35.00 |
| Oct. 29 | 9.00 | 9.12½ | 7.50 | 51.10 | 51.12½ | 3.70 | 3.55 | 3.82½ | *19.00 | 9.50 | 35.00 |
| Oct. 30 | 9.00 | 9.12½ | 7.50 | 51.30 | 51.32½ | 3.70 | 3.55 | 3.85 | *19.00 | 9.75 | 35.00 |
| Oct. 31 | 9.00 | 9.12½ | 7.50 | 51.12½ | 51.15 | 3.70 | 3.55 | 3.82½ | *19.00 | 9.75 | 35.00 |
| Nov. 1 | 9.00 | 9.12½ | 7.37½ | 51.15 | 51.20 | 3.70 | 3.55 | 3.82½ | *19.00 | 10.00 | 35.00 |
| Nov. 2 | 9.00 | 9.12½ | 7.37½ | 51.12½ | 51.17½ | 3.70 | 3.55 | 3.80 | *19.00 | 10.12½ | 35.00 |

*Nominal range 19.00c to 21.00c.

# Warehouse Iron and Steel Prices

*Cents per pound for delivery within metropolitan districts of cities specified*

| STEEL BARS | |
|---|---|
| Baltimore* | 2.90c |
| Boston†† | 2.95c |
| Buffalo | 3.00c |
| Chattanooga | 3.31c |
| Chicago | 2.95c |
| Cincinnati | 3.15c |
| Cleveland | 2.95c |
| Detroit | 3.03½c |
| Houston | 3.00c |
| Los Angeles | 3.70c |
| New Orleans | 3.30c |
| New York‡(d) | 3.22c |
| Pittsburgh(h) | 2.90c |
| Philadelphia* | 2.90c |
| San Francisco | 3.60c |
| Seattle | 3.60c |
| St. Louis | 3.19c |
| St. Paul | 3.00c |
| Tulsa | 3.25c |

| IRON BARS | |
|---|---|
| Portland | 3.40c |
| Chattanooga | 3.31c |
| Baltimore* | 3.00c |
| Chicago | 2.75c |
| Cincinnati | 3.15c |
| New York‡(d) | 3.32c |
| Philadelphia* | 2.90c |
| St. Louis | 3.19c |
| Tulsa | 3.25c |

| REINFORC. BARS | |
|---|---|
| Buffalo | 2.60c |
| Chattanooga | 3.31c |
| Chicago | 2.10c-2.60c |
| Cleveland (c) | 1.97½c |
| Cincinnati | 3.25c |
| Houston | 3.25c |
| Los Ang., cl. | 2.15c |
| New Orleans | 3.50c |
| Pitts., plain(h) | 3.05c |
| Pitts., twisted squares (h) | 3.175c |
| San Francisco | 2.45c |
| Seattle | 3.50c |
| St. Louis | 3.24c |
| Tulsa | 3.25c |
| Young | 2.30c-2.60c |

| SHAPES | |
|---|---|
| Baltimore* | 3.90c |
| Boston†† | 3.17c |
| Buffalo | 3.25c |
| Chattanooga | 3.56c |
| Chicago | 3.20c |
| Cincinnati | 3.40c |
| Cleveland | 3.31c |
| Detroit | 3.40c |
| Houston | 3.00c |
| Los Angeles | 3.70c |
| New Orleans | 3.55c |
| New York(d) | 3.37c |
| Philadelphia* | 2.95c |
| Pittsburgh(h) | 3.15c |
| Portland | 3.55c |
| San Francisco | 3.55c |
| Seattle | 3.55c |
| St. Louis | 3.44c |
| St. Paul | 3.25c |
| Tulsa | 3.50c |

| PLATES | |
|---|---|
| Baltimore* | 2.90c |
| Boston†† | 3.18c |
| Buffalo | 3.37c |
| Chattanooga | 3.56c |
| Chicago | 3.20c |
| Cincinnati | 3.40c |
| Cleveland, ¼-in. and over | 3.31c |
| Detroit | 3.40c |
| Detroit, ⅜-in. | 3.65c |
| Houston | 3.00c |
| Los Angeles | 3.70c |
| New Orleans | 3.55c |
| New York(d) | 3.40c |
| Philadelphia* | 2.95c |
| Phila. floor | 4.95c |
| Pittsburgh(h) | 3.15c |
| Portland | 3.55c |
| San Francisco | 3.55c |
| Seattle | 3.55c |
| St. Louis | 3.44c |
| St. Paul | 3.25c |
| Tulsa | 3.50c |

| NO. 10 BLUE | |
|---|---|
| Baltimore* | 3.05c |
| Boston†† | 3.25c |
| Buffalo | 3.62c |
| Chattanooga | 3.36c |
| Chicago | 3.00c |
| Cincinnati | 3.20c |
| Cleveland | 3.11c |
| Det., 8-10 ga. | 3.13½c |
| Houston | 3.35c |
| Los Angeles | 3.80c |
| New Orleans | 3.55c |
| New York | 3.27c |
| Portland | 3.75c |
| Philadelphia* | 3.05c |
| Pittsburgh(h) | 2.95c |
| San Francisco | 3.75c |
| Seattle | 3.75c |
| St. Louis | 3.29c |
| St. Paul | 3.45c |
| Tulsa | 3.70c |

| NO. 24 BLACK | |
|---|---|
| Baltimore*† | 3.51c |
| Boston (g) | 3.90c |
| Buffalo | 3.25c |
| Chattanooga | 4.21c |
| Chicago | 3.85c |
| Cincinnati | 4.05c |
| Cleveland | 3.91c |
| Detroit | 3.98½c |
| Los Angeles | 4.45c |
| New York | 3.85c |
| Philadelphia*† | 3.55c |
| Pitts.** (h) | 3.55c |
| Portland | 4.40c |
| San Francisco | 4.40c |
| Seattle | 4.40c |
| St. Louis | 4.09c |
| St. Paul | 3.695c |
| Tulsa | 4.75c |

| NO. 24 GAL. SHEETS | |
|---|---|
| Baltimore *† | 4.21c |
| Buffalo | 4.00c |
| Boston (g) | 4.60c |
| Chattanooga | 4.86c |
| Chicago (h) | 4.55c |
| Cincinnati | 4.70c |
| Cleveland | 4.61c |
| Detroit | 4.70c |
| Houston | 4.40c |
| Los Angeles | 5.05c |
| New Orleans | 4.95c |
| New York | 4.50c |
| Philadelphia*† | 4.25c |
| Pitts.** (h) | 4.15-4.45c |
| Portland | 5.00c |
| San Francisco | 5.00c |
| Seattle | 5.00c |
| St. Louis | 4.79c |
| St. Paul | 4.19c |
| Tulsa | 5.10c |

| BANDS | |
|---|---|
| Baltimore* | 3.15c |
| Boston†† | 3.25c |
| Buffalo | 3.42c |
| Chattanooga | 3.61c |
| Chicago | 3.30c |
| Cincinnati | 3.45c |
| Cleveland | 3.36c |
| Detroit, ⅜-in. and lighter | 3.38½c |
| Houston | 3.25c |
| Los Angeles | 3.90c |
| New Orleans | 3.95c |
| New York(d) | 3.62c |
| Philadelphia | 3.15c |
| Pittsburgh(h) | 3.20c |
| Portland | 3.90c |
| San Francisco | 4.05c |
| Seattle | 3.90c |
| St. Louis | 3.54c |
| St. Paul | 3.20c |
| Tulsa | 3.45c |

| HOOPS | |
|---|---|
| Baltimore | 2.80c |
| Boston | 4.25c |
| Buffalo | 3.42c |
| Chicago | 3.30c |
| Cincinnati | 3.45c |
| Det., No. 14 and lighter | 3.38½c |
| New York | 3.62c |
| Philadelphia | 3.40c |
| Pittsburgh(h) | 3.70c |
| Seattle | 5.60c |
| St. Louis | 3.54c |
| St. Paul | 3.75c |

| COLD FIN. STEEL | |
|---|---|
| Baltimore(c) | 3.71c |
| Boston | 4.00c-4.50c |
| Buffalo (h) | 3.55c |
| Chattanooga* | 4.06c |
| Chicago (h) | 3.50c |
| Cincinnati | 3.70c |
| Cleveland(h) | 3.50c |
| Detroit | 3.63½c |
| Los Ang.(f)(d) | 4.95c |
| New Orleans | 4.30c |
| New York | 3.92c-4.42c |
| Philadelphia | 3.73c |
| Pittsburgh(h) | 3.45c |
| Portland (f) | 4.75c |
| San Fran.(f)(d) | 5.95c |
| Seattle(f)(d) | 4.75c |
| St. Paul | 3.20c |
| St. Louis | 3.74c |
| Tulsa | 4.65c |

| COLD ROLL. STRIP | |
|---|---|
| Boston, 0.100-in., 500 lb. lots | 5.35c |
| Buffalo | 3.39c |
| Chicago | 3.27c |
| Cincinnati(b) | 3.42c |
| Cleveland (b) | 3.20c |
| Detroit | 3.33c |
| New York | 4.70c |
| St. Louis | 3.36c |

## Current Iron and Steel Prices of Europe

**Dollars at Rates of Exchange, Nov. 1**

### Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

| | British gross tons U. K. ports | | Continental Channel or North Sea ports, metric tons | |
|---|---|---|---|---|
| PIG IRON | £ s d | | Quoted in dollars at current value | **Quoted in gold pounds sterling £ s d |
| Foundry, 2.50-3.00 Silicon | $14.97 | 3 0 0 | $13.41 | 1 13 0 |
| Basic bessemer | 13.47 | 2 14 0* | 12.59 | 1 11 0 |
| Hematite, Phos. .03-.05 | 15.09 | 3 0 6 | ..... | ..... |
| **SEMIFINISHED STEEL** | | | | |
| Billets | $27.45 | 5 10 0 | $19.10 | 2 7 0 |
| Wire rods, No. 5 gage | 38.92 | 7 16 0 | 27.57 | 4 10 0 |
| **FINISHED STEEL** | | | | |
| Standard rails | $38.66 | 7 15 0 | $44.71 | 5 10 0 |
| Merchant bars | 1.67c | 7 10 0 | 1.16c to 1.21c | 3 2 6 to 3 5 0 |
| Structural shapes | 1.64c | 7 7 6 | 1.14c | 3 1 6 |
| Plates, †¼ in. or 5 mm | 1.78c | 8 0 0 | 1.52c | 4 2 6 |
| Sheets, black, 24 gage or 0.5 mm. | 2.05c | 9 5 0 | 1.95c | 5 5 0 |
| Sheets, gal., 24 gage, corr. | 2.50c | 11 5 0 | 2.39c | 6 10 0 |
| Bands and strips | 1.83c | 8 5 0 | 1.47c | 4 0 0 |
| Plain wire, base | 2.05c | 9 5 0 | 1.99c | 5 7 6 |
| Galvanized wire, base | 2.50c | 11 5 0 | 2.30c to 2.33c | 6 5 6 to 6 7 6 |
| Wire nails base | 2.66c | 12 0 0 | 2.12c | 5 15 0 |
| Tin plate, box 108 lbs. | $ 4.49 | 0 18 2 | ..... | ..... |

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

### Domestic Prices at Works or Furnace—Last Reported

| | £ s d | | French Francs | | Belgian Francs | | Reich Marks | |
|---|---|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5 | $16.84 | 3 7 6(a) | $13.84 | 210 | $14.45 | 310 | $25.36 | 63 |
| Basic bessemer pig iron | 16.84 | 3 7 6(a)* | 12.19 | 185 | 13.28 | 285 | 27.98 (b) | 69.50 |
| Furnace coke | 4.37 | 0 17 6 | 7.91 | 120 | 5.12 | 110 | 7.65 | 19 |
| Billets | 27.45 | 5 10 0 | 28.34 | 430 | 20.50 | 440 | 38.85 | 96.50 |
| Standard rails | 1.83c | 8 5 0 | 2.10c | 700 | 2.31c | 1,100 | 2.42c | 132 |
| Merchant bars | 1.91c | 8 12 0 | 1.68c | 560 | 1.16c | 550 | 2.01c | 110 |
| Structural shapes | 1.94c | 8 15 0 | 1.65c | 550 | 1.16c | 550 | 1.97c | 107.50 |
| Plates, †¼-in. or 5 mm. | 1.87c | 8 8 9 | 2.10c | 700 | 1.47c | 700 | 2.32c | 127 |
| Sheets, black | 2.33c | 10 10 0§ | 2.55c | 850‡ | 1.63c | 775‡ | 2.64c | 144‡ |
| Sheets, galv., corr., 24 ga. or 0.5 mm. | 2.89c | 13 0 0 | 4.50c | 1,500 | 3.15c | 1,500 | 6.77c | 370 |
| Plain wire | 2.05c | 9 5 0 | 3.39c | 1,130 | 2.31c | 1,100 | 3.17c | 173 |
| Bands and strips | 2.08c | 9 7 0 | 1.95c | 650 | 1.47c | 700 | 2.32c | 127 |

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del Middlesbrough. b Since January.

**Gold pound sterling carries a premium of 67.647 per cent over paper sterling.

(b) Plus straightening, cutting and quantoty differentials.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff

(e) New mill classif

(f) Rounds only.

(g) 50 bundles or over.

(h) Outside delivery 10c less.

‡Domestic bars.

*Plus quan. extras

**Under 25 bundles.

*†50 or more bundles

†New extras apply

††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

# Bars

Bar Prices, Page 72

**Pittsburgh** — Specifications from the cold-drawn bar industry continued to account for an increased movement in hot-rolled bars. Some nonintegrated cold drawers ended October at 30 to 35 per cent ahead of September in specifications and shipments. In addition, agricultural implement manufacturers are taking fair lots of hot-rolled bars, the market on which is firmly quoted 1.80c, Pittsburgh.

**Cleveland**—Rise in steel ingot production here from 25 to 50 per cent over the past two weeks for the Corrigan, McKinney Steel Co. has been due mainly to improved demand for sheet bars, although steel bar bookings also have improved. The ingots are not being produced for stock, but in addition to new output some ingots actually are being taken from stocks. Automotive steel bar requirements have expanded moderately. More tonnage is coming from agricultural implement and miscellaneous manufacturers. Willys-Overland Co., Toledo, O., has purchased material for 2500 cars, reopening its plant under court order to make 15,000.

**Chicago**—The upward tendency in demand for soft steel bars continues but at a slow rate. Farm implement manufacturers continue relatively active users with little change in demand from miscellaneous consumers.

**Boston**—Commercial steel bars are slighty more active there being a gain in small orders, a broader miscellaneous demand for immediate needs.

**New York**—Commercial bar buying is little changed from a week ago but better than a month ago. Demand is largely miscellaneous.

**Washington**—Bids will be taken Nov. 13 by the bureau of supplies and accounts, navy department, on 5000 pounds of class B round heat-treated bar steel and 50,000 pounds of grade M medium bar steel. This bureau will take bids Nov. 1 for 10,240 pounds and Nov. 20 for 283,360 pounds of steel forgings for turbine rotors.

**Philadelphia**—Steel bar sales are slightly better than a week ago, with opening of bids Nov. 2 by the navy the feature. The market is steady at 2.09c, Philadelphia.

## Cold Finished

Cold Finished Prices, Page 73

**Pittsburgh**—While important buying from the automotive industry is expected to develop this month for shipment and fabrication in December, volume of cold-drawn bar specifications from other industries is at a gratifying total. The 2.10c Pittsburgh market continues firm on carbon cold-drawn bars and the alloy cold-drawn base at 2.95c, Pittsburgh.

# Plates

Plate Prices, Page 72

**Pittsburgh**—The first large private barge order in this district in many months was placed last week when Campbell Transportation Co., Pittsburgh, bought 13 barges for Ohio river use, requiring about 2500 tons of steel plates. Up until late last week, at least two other large inquiries were about to be closed upon. One of these, from the West Kentucky Coal Co., Paducah, Ky., will be awarded about Nov. 15. This buyer took bids Oct. 27 on five, seven or ten standard coal barges. The other inquiry is for 24 coal barges from a subsidiary of Commonwealth Edison Co., Chicago. American Bridge Co., Pittsburgh, has been awarded a contract to supply 56 tons of wall armor for reconstruction of lock No. 14 in the Ohio river near Pittsburgh. Approximately 4000 tons of hot-rolled products, mainly plates, attracted bids from all Pittsburgh platemakers last week when the navy department opened bids Nov. 2.

**Cleveland**—The market is quiet, with tank work lacking. Railroads are buying little material. An Akron, O., plate fabricator's plant has resumed work after a week's strike.

**Chicago**—Standard Oil Co. of California has placed an order for floating roofs to be used in connection with storage tanks awarded recently. The roofs will take about 600 tons of plates. Beer tanks ordered by an Evansville, Ind., brewery involve 200 tons. Plate sales and specifications generally continue light, retarded in a measure by poor requirements of railroads. Dams at Muscatine, Iowa, and Winona, Minn., are among prospective work involving substantial plate tonnages.

**Boston**—Except for about 1100 tons for the Portsmouth, N. H., navy yard, closing Nov. 16, plate inquiry is for small miscellaneous lots. There has been a decline in large tank inquiry.

**New York**—With 4000 tons of steel plates for oil company tanks active the navy is inquiring for additional ship tonnage and releases on contracts for navy ships make the market increasingly lively. New navy work includes 4100 tons of plates, shapes and sheets, mostly plates, on which bids open Nov. 16 for destroyer and submarine construction, in addition to about 4000 tons on which the navy opened bids Nov. 2. The navy is expected to issue inquiries for steel for cruisers to be built in its own yards as soon as details are completed. In addition to 1500 tons which may be required for caissons about 1300 tons of plates are pending for the superstructure for the postoffice here, on which bids will be opened shortly.

**Philadelphia**—Except for opening of navy bids Nov. 2 the plate market is dull and prices are steady.

**Washington**—Bids will be taken Nov. 6 by the bureau of supplies and accounts, navy department, for 75,600 pounds of black grade M medium steel plates; Nov. 16 for 2400 pounds of steel plates.

**San Francisco**—Plate demand continues slow and only one project of 100 tons or more was reported placed during the week. Plate fabricators were disappointed in the award for the Los Angeles aqueduct which was let for reinforced pipe. Over 5800 tons of plates were involved. Bids will be opened Oct. 31 for the second portion of the aqueduct, requiring 4100 tons.

## Contracts Placed

2500 tons, 13 Ohio river barges for Campbell Transportation Co., Pittsburgh; McClintic-Marshall Corp., Bethlehem, Pa., awarded eight standard coal barges, and Jones & Laughlin Steel Corp., Pittsburgh, awarded five down-river type barges.

600 tons, tank roofs, Standard Oil Co. of California, to unstated interest.

200 tons, 20 tanks, Cook brewery, Evansville, Ind., to Graver Tank & Mfg. Corp., East Chicago, Ind.

100 tons, 200,000-gallon water tank, Stillwater, N. Y., to Chicago Bridge & Iron Works, Chicago, Solomon & Keis, Troy, N. Y., engineers.

## Contracts Pending

4500 to 5000 tons, estimated, 24 standard coal barges for subsidiaries of commonwealth Edison Co., Chicago.

2235 tons, plates and sheets, mainly former, black and galvanized, mostly black, bureau of supplies and accounts, navy department, delivery, Portsmouth, N. H., (Kittery, Me.), and Mare Island, Calif.; bids Nov. 16, schedule 3660.

100 tons, one steel oil barge, 100 x 30 x 7 feet, for Norfolk, Va., army engineers; Bethlehem Ship Building Co., Fore River, Mass., low at $15,000; McClintic-Marshall Corp., Bethlehem, Pa., second low, at $15,290; Treadwell Construction Co., Midland, Pa., third, at $18,650, and Dravo Contracting Co., Pittsburgh, fourth at $19,900.

100 tons, 14-inch steel pipe, Upland, Calif.; bids opened.

Unstated tonnage, 363 special class steel plate buoys, welded construction, with steel bottom casting, for superintendent of lighthouses, Staten Island, N. Y.; bids Nov. 12; same buyer will close Nov. 15 on 120 wrought iron buoy swivels, 1100 wrought steel buoy shackles with riveted pins and 7000 steel shackles with split keys.

# Sheets

Sheet Prices, Page 72

**Cleveland**—Automobile manufacturers and partsmakers are placing heavier orders. Ford is understood to have released material for 15,000 cars, taking about 7000 tons of sheets, strip and other rolled material. General Motors and Chrysler also have made substantial purchases, subject to release this month. While these are small compared with normal requirements, producers see in them the beginning of improved buying by the industry. A nearby lake sheet mill working entirely on automobile account resumed production for the first time since the first week of October, operating full time. It has sufficient specifications in hand to continue at this rate for several weeks. Prices apparently are firm; three months ago automobile business was pried loose by some makers cutting the market. Manufacturers of household equipment continue active.

**Pittsburgh**—Better buying volume, including some specifications from the Detroit district, was noted in the sheet market last week, although shipments continue at a poor rate. Electrical refrigerator makers are taking slightly increased lots, as are small tank builders. Prices are steady.

A. M. Byers Co., Pittsburgh, has issued new differential and extra cards covering wrought iron galvanized sheets and wrought iron hot rolled sheets made by the company superseding previous cards dated Sept. 1, 1933. Changes are principally in size extras.

**Chicago**—Sheet demand continues to gain steadily, business being relatively better than in the majority of other steel products. Automotive orders have improved slightly during the past week but tonnages still are considerably lighter than the volume expected to be placed within the next several weeks. Miscellaneous consumers show gains in their orders, part of this being due to reductions in inventories which previously were supporting operations and making new buying unnecessary.

**New York**—Domestic sheet demand is listless, although export inquiry is featured by approximately 4000 tons of hot and cold rolled sheets for the Amtorg Trading Corp., for Russia. The material is said to be for light automobile construction. Two years' credit is desired.

The price of $4.69 a base box, Pittsburgh, on 4-pound coated terne plate, filed with American Iron and Steel Institute, effective Nov. 10, is a restatement of the old package price. This package price of $9.38 has been broken down into a base box of $4.69, there being the equivalent of two packages to the box.

**Washington**—Bids will be taken Nov. 9 by the bureau of supplies and accounts, navy department, for 43,763 pounds of grade one, finish two, corrosion resisting sheets, and 1020 pounds of grade one, finish four, corrosion resisting steel strip. Nov. 13 bids will be opened for 75,800 pounds of grade M, black, medium steel sheets.

**Philadelphia**—With stovemakers and stovepipe joint manufacturers nearing the end of their buying season, sheet sellers are looking to the autobody industry to pick up. New Jersey opened bids last week for 1935 automobile tag requirements.

**Buffalo**—Only minor gains have been recorded in sheet production in this district. Production continues below 20 per cent.

**Cincinnati** — Sheet production in this district continues upward to meet a broader demand. Orders are being held close to early needs.

**St. Louis**—Sheet buying continues spotty, with light volume. Miscellaneous requirements predominate.

**Birmingham, Ala.**—Sheet mills have kept fairly busy. With crops being gathered rapidly and much money being distributed among farmers, farms are being improved, sheet, wire and wire products being in demand from industrial interests.

# Pipe

Pipe Prices, Page 73

**Pittsburgh**—To accommodate a growing market for alloy tubing to be used in automobile front axles a filing was made last week, effective Nov. 10, on chrome-molybdenum tubing in the SAE 4100 series. Tubing ranging from ½ to 3-inch outside diameter in 0.146-inch or less wall thickness, cold drawn, is to become established at 8.75c, Pittsburgh, Canton, O., and Milwaukee. This, in effect, is a classification of section G to the mechanical tubing price schedule which applies to automotive requirements.

Some pipe inquiries are fairly promising for small feeder lines in the East Texas field now that assurances are general that the hot-oil restriction will not become ungovernable. Bids on 69,000 lineal feet of 6-inch pipe, 52,000 feet of 8-inch, 6500 feet of 18-inch and 3000 feet of 12-inch pipe for the Fort Peck, Montana, dam spillway have been readvertised for Nov. 12, by the Kansas City army engineers. Low general contract bids recently submitted were rejected.

**Cleveland**—For the easterly sewage disposal plant, Cleveland, approximately $350,000 worth of boilers, pumps and other equipment was awarded during the week. This insures that the city will go ahead with the project to pump sludge from the easterly to the southerly plant, and it is expected specifications will be issued shortly for 3000 tons of 12-inch cast pipe. Construction work generally is providing a poor outlet for pipe tonnage, although jobbers' sales in this district recently have improved.

**Chicago**—Except for the placing of a moderate tonnage made up of carload lots and less, the cast pipe market generally is quiet. However, nearly 2000 tons will be required for several installations in southern Illinois while awards are awaited at Madison, Wis., and in Chicago.

**New York**—For Stillwater and Bethlehem, N. Y., approximately 950 tons of cast pipe has been placed with two foundries. Except for these purchases, buying and inquiry are reported light.

**Buffalo**—Demand for pipe continues active throughout this district. Oil and gas line development is on a large scale and considerable tonnage is involved in pending water system extensions. This year will be the best since 1929 for many sellers of pipe, it is reported.

**San Francisco**—No cast iron pipe awards of importance were reported placed and new business is slow in coming out. Action again has been delayed on 7469 tons of high-pressure pipe for San Francisco. Pipe distributors in the Los Angeles district report increased demand by oil companies for material out-of-stock, the movement so far this month being double that for August and for September.

**Seattle**—There is no change from the decided lull which has prevailed for more than a month in the pipe market. Oregon work relief program includes $36,000 for Reedsport where 17,384 feet of 12-inch mains will be required.

## Cast Pipe Placed

500 tons, 10-inch, Bethlehem, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

450 tons, 6 and 8-inch, Stillwater, N. Y., to Central Foundry Co., Birmingham, Ala.; Solomon & Kies, Troy, N. Y., engineers.

150 tons, 24 and 30-inch, Beverly-Salem, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

125 tons, small sizes, Natick, Mass., to R. D. Wood & Co., Florence, N. J.

Unstated tonnage, 1190 feet of 8-inch.

waterworks, Abbottsford, Wis., to Central Foundry Co., Birmingham, Ala.

## Cast Pipe Pending

3000 tons, 12-inch, sludge discharge line from easterly to southerly sewage disposal plant, Cleveland.

171 tons, 8 and 12-inch, class B, Huntington Park, Calif.; bids Nov. 5.

Unstated tonnage, 5000 feet of 6 and 8-inch, fire protection system, Hilbert, Wis.; bids soon.

Unstated tonnage, 12,040 feet of 10-inch, pressure sewer, state hospital, Mendota, Wis.; bids Nov. 13.

# Transportation

**Track Material Prices, Page 73**

Equipment furnishes most of the activity in the railroad market, rail buying being at a minimum and track fastening demand light. Mexican Railway, Mexico City, has placed 20 all-steel auto and 30 all-steel box cars with Pressed Steel Car Co., Pittsburgh. An eastern railroad has bought 50 gondolas from the excess of another road.

Contrary to recent reports the Anglo-Mexican Petroleum Co. Ltd., New York, has not purchased tank cars or other rolling equipment. Lehigh Valley has postponed opening of bids on 250 seventy-ton gondolas to Nov. 9. This road has reduced its repair program to 1100 box cars instead of 1500 originally planned. Action on 57 electric locomotives for the Pennsylvania is still pending decision on design. Chesapeake & Ohio has placed three pusher locomotives with the Atlas Car & Mfg. Co., Cleveland. Funds are available for the purchase by the Illinois Central of a streamlined train and 11 diesel switching locomotives, for which bids were asked some time ago. An award is expected soon. Chicago, North Shore & Milwaukee has been authorized by the interstate commerce commission to borrow $253,577 from PWA for maintenance work, including new rails and crossing elimination.

Mesta Machine Co., West Homestead, Pa., recently received delivery on two 100-ton cars manufactured by the Standard Steel Car Co., Butler, Pa., for the Mesta company's own use at its West Homestead, Pa., plant. It is understood that Mesta Machine Co. has ordered four cars; two being flats and two gondolas. Second-hand trucks are being used on all four, and the units are equipped with a heavy type of Timken bearing.

Norfolk & Western closes Nov. 14 on 10,000 tons of 131-pound rails and at the same time on 4000 kegs of railroad track spikes and an unstated tonnage of tie plate requirements. Early award is expected and the major share of the rail order undoubtedly will come to the Pittsburgh rail producer.

## Car Orders Placed

Mexican Railway, Mexico City, 20 all-steel auto and 30 all-steel box cars, to Pressed Steel Car Co., Pittsburgh.

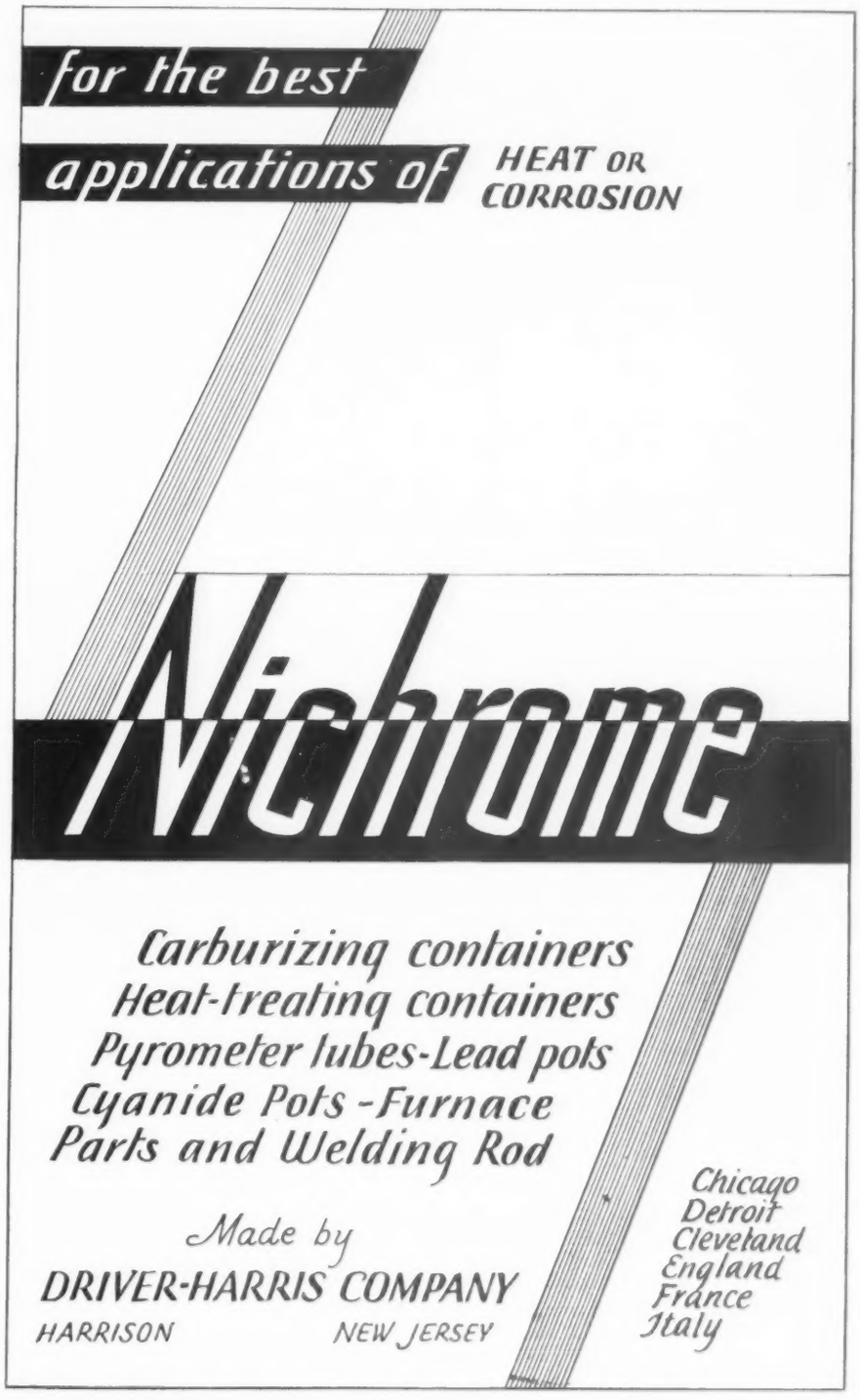
## Locomotives Placed

Chesapeake & Ohio, three pusher locomotives, to Atlas Car & Mfg. Co., Cleveland.

## Ferroalloys

**Ferroalloy Prices, Page 74**

Ferromanganese specifications at Pittsburgh in October were at about the same level as those in September and both months were ahead of the mid-summer period. Users are not building up normal inventories of ferromanganese, as far as can be ascertained. The price holds at $85, duty paid, Atlantic coast points.



# Shapes

Structural Shape Prices, Page 72

**Pittsburgh** — Award of several thousand tons of structural steel to American Bridge Co. is expected for Carnegie Steel Co.'s new strip mill building at Youngstown, O., in view of ratification last week of plans to proceed with this project. Some fair size lock and dam work is being inquired for, including 2000 tons for the Gallipolis, O., dam and 950 tons in gate frames for the Joe Wheeler dam. Interest was keen last week on the 1200-ton Leechburg, Pa., bridge which attracted over 20 general contractors' prices. Bids closed at Harrisburg, Pa., Nov. 2.

**Cleveland**—Several small industrial building projects were awarded here during the week, while the highway commission issued specifications for the Lorain avenue bridge over Rocky river, Cuyahoga county, Ohio, which will require 3000 tons of shapes, about 1000 tons more than anticipated by fabricators. Bids will be opened Nov. 16 at Columbus. Toledo Terminal railway, Toledo, O., is taking bids on a bridge requiring 200 tons.

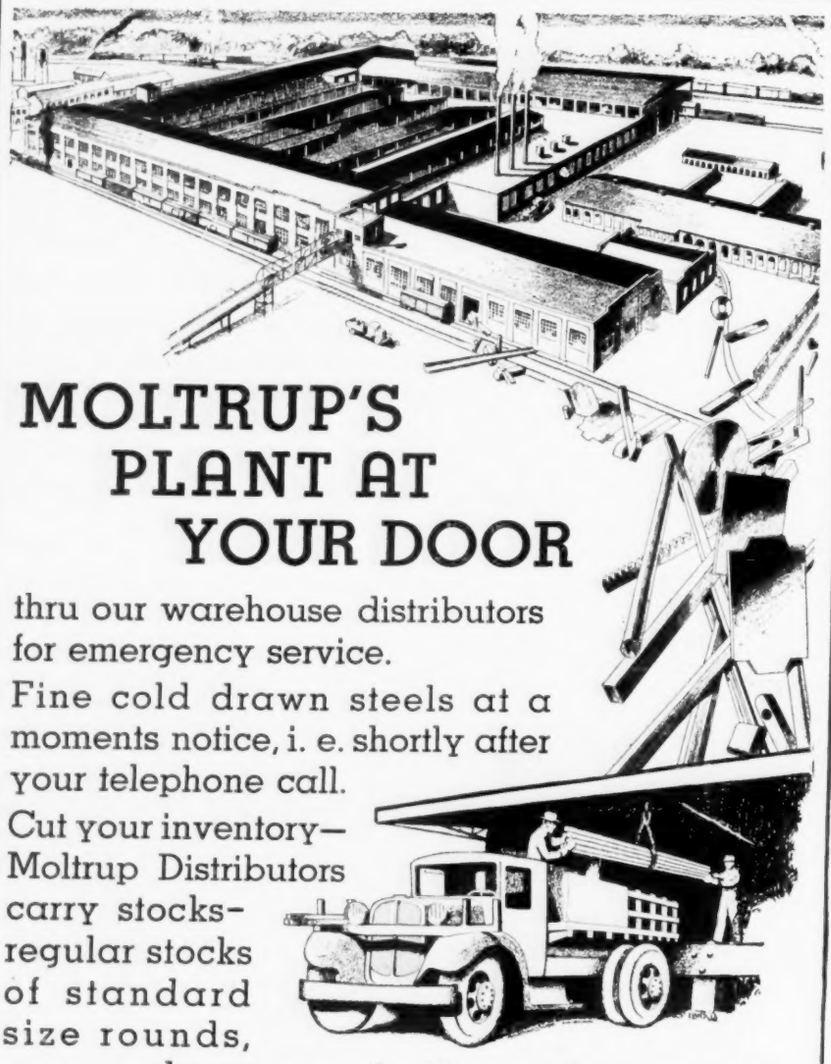
**Chicago**—Specifications for the Muscatine, Iowa, dam include 2500 tons of plates and shapes and 2600 tons of piling. Bids close Nov. 27. Plans for the Winona, Minn., dam are to be issued soon. Other inquiries involve bridges principally, the largest being 2500 tons for a structure at Monroe and Alexander, La. Inquiries from this district are few and take small individual lots.

**Boston**—Award of 8500 tons for the Boston parcel post building superstructure still pends. Federal PWA loans are about exhausted and funds for the project may be made available from a separate fund. New inquiry is light.

**New York**—Structural steel demand has slumped to the lowest point in several years, there being but a few thousand tons active in the entire district, including several schools and state bridges. Bids are due to close Nov. 9 on the downtown federal building, Manhattan, taking 20,000 tons of steel, but this project may be again delayed.

Bookings of fabricated structural steel during September registered a low for the recovery period, according to final figures to the American Institute of Steel Construction, New York. The records materially lowered the average for the third quarter. This was 17 per cent less than the average bookings of the first quarter of 1934 and approximately 30 per cent less than the average bookings of the second quarter of this year. Shipments in September fell below those of August, but were approximately 29 per cent larger than for the same month last year.

**Philadelphia**—A provisional award of 300 tons has been made for the Delaware river bridge to Belmont Iron Works, Philadelphia. While bids have been opened for the ad-

MOLTRUP'S PLANT AT YOUR DOOR

thru our warehouse distributors for emergency service.

Fine cold drawn steels at a moments notice, i. e. shortly after your telephone call.

Cut your inventory—Moltrup Distributors carry stocks—regular stocks of standard size rounds, squares, hexagons, shafting and screw stock almost at your door. *Consult your telephone directory.*

•

**Moltrup Steel Products Co.**

**Beaver Falls, Pa.**

(Pittsburgh District)

New York • Chicago • Philadelphia • Cleveland • Boston • Houston • Detroit • Erie
San Francisco • Atlanta • Norfolk • Seattle • Pittsburgh • Buffalo • Dayton


## Shape Awards Compared

| | Tons |
|---|---|
| Week ended Nov. 3 | 7,250 |
| Week ended Oct. 27 | 14,183 |
| Week ended Oct. 20 | 13,043 |
| This week in 1933 | 14,809 |
| Weekly average, 1933 | 9,296 |
| Weekly average, 1934 | 16,389 |
| Weekly average, October | 15,673 |
| Total to date, 1933 | 643,269 |
| Total to date | 737,512 |

ministration building of a government aircraft development here bids for the factory building have been postponed temporarily. The factory will require 800 tons of shapes and concrete bars.

Chrysler Automobile Co. is planning to build a $1,000,000 assembly plant in Baltimore. This, like the Chevrolet assembly plant now under construction there may require about 5000 tons of steel, mainly shapes.

Bendix Products Corp., South Bend, Ind., is scheduling construction of an aviation plant at Newark, N. J.

**Duluth**—American Steel & Wire Co.'s plant here is fabricating 585 tons of steel posts, small shapes, on an order from the state of Minnesota booked recently. The posts are 7 feet long, with a T cross section, and are for use in erecting snow fences.

**San Francisco**—Structural lettings are light, less than 300 tons being placed during the week. To date this year 107,225 tons have been awarded as compared with 221,573 tons in the corresponding period in 1933. Projects now pending aggregate over 7600 tons.

**Seattle**—Some business is pending, but new projects are lacking. For the Coulee dam project, Jeffrey Co. has taken two general contracts, totaling $500,000 for construction of the 48 and 60-inch conveyor systems, 200 tons of structurals for which will be fabricated by Pacific Car & Foundry Co., Seattle. Contract for the Coulee dam bridge, 1500 tons, is under consideration.

## Shape Contracts Placed

865 tons, dock shed for Gulfport, Miss., to Jones & Laughlin Steel Corp., Pittsburgh.

670 tons, bridge NRM S-A, Ottawa county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

550 tons, bridge, NRH 335-D, Osage county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

515 tons, state highway bridge, Prophetstown, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, Delaware river bridge commission, Philadelphia, provisionally awarded to Belmont Iron Works, Philadelphia.

270 tons, addition, Kress store, Columbia, S. C., to Ingalls Iron Works, Birmingham, Ala.

250 tons, bridge, Douglas county, Nebr., to Omaha Steel Works, Omaha, Nebr.

240 tons, bridge over Connecticut river between Hanover, N. H., and Norwich, Vt., to American Bridge Co., Pittsburgh.

235 tons, state highway bridge, Hampton, N. J., to Phoenix Bridge Co., Phoenixville, Pa.

225 tons, bridge, Chicago Heights, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

220 tons, angles for Diablo transmission towers, Seattle, to Pacific Coast Steel Corp., Seattle.

215 tons, bridge, Big Sandy river, Pike county, Kentucky, to R. C. Mahon Co., Detroit.

210 tons, Hampton avenue, viaduct, St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

205 tons, bridge No. 4176, Franklin county, Arkansas, to St. Louis Structural Steel Co., East St. Louis, Ill.

200 tons, bridge, Donaldson, Ark., to Arkansas Foundry Co., Little Rock, Ark.

200 tons, conveyor system, Coulee dam project, Washington, to Pacific Car & Foundry Co., Seattle.

180 tons, dormitory, Miami university, Oxford, O., to Truscon Steel Co., Youngstown, O.

170 tons, beams and girder spans, Harlan county, Kentucky, to Midland Structural Steel Co., Chicago.

160 tons, state highway bridge, Benham, Ky., to Midland Structural Steel Co., Chicago.

160 tons, bridge No. 3158, Sevier county, Arkansas, to Virginia Bridge & Iron Co., Roanoke, Va.

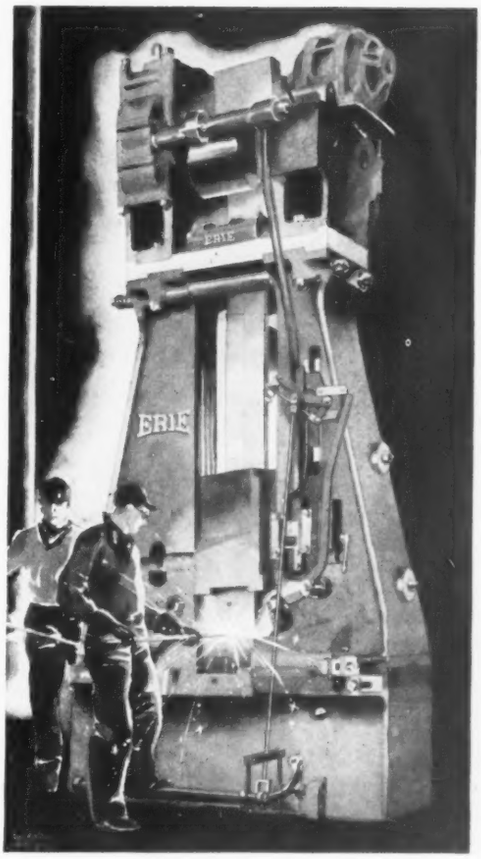
150 tons, building alterations, Isaly Dairy Co., Youngstown, O., to Truscon Steel Co., Youngstown.

150 tons, 25th and Chestnut street school alteration, Long Beach, Calif., to Pacific Iron & Steel Co., Los Angeles.

145 tons, bridge, PWA 76-SB-3A, Oregon county, Missouri, to St. Louis Structural Steel Co., East St. Louis, Ill.

130 tons, bridge, NRH 40-C-2, McCurtain county, Oklahoma, to Capital


# Are You Dominated by the Profit Motive?




Don't be embarrassed by the question for we hope your answer is "Yes".

If you are interested in operating your shop profitably, you are interested in replacing your obsolete hammers and presses with modern "ERIE" machines. Unless you've studied the question lately, you'll be astonished by the strides made in the last few years by our designers.

From the standpoint of production, accuracy, and maintenance costs, you can't afford to operate your old hammers, or to buy, even at give-away prices, second-hand hammers not of modern design.

## ERIE FOUNDRY COMPANY

**ERIE, PENNA., U. S. A.**

*Detroit* 335 Curtis Bldg. — *Chicago* 549 Washington Blvd. — *Indianapolis* 335 Postal Station Bldg. — *Paris, France* 8 Rue de Rocroy

ERIE

Steel & Iron Co., Oklahoma City, Okla.
125 tons, Shorewood high school auditorium, Milwaukee, to William F. Eichfeld & Sons Co., Milwaukee.
110 tons, fabricated beams, Demonbreun viaduct, Nashville, Tenn., to Nashville Bridge Co., Nashvile.
100 tons, addition to plant, Hankins Container Co., Cleveland, to Fort Pitt Bridge Works, Pittsburgh.
100 tons, bridge, building, Iowa City, Iowa, to Iowa Steel & Iron Works, Cedar Rapids, Iowa.
100 tons, bridge, Meridosia, Ill., to Illinois Steel Bridge Co., Jacksonville, Ill.
100 tons, Hawthornden farms of Cleveland State hospital, Northfield, O.; 60 tons of shapes to Fort Pitt Bridge Works, Pittsburgh; 40 tons of concrete bars to Truscon Steel Co., Youngstown, O.

## Shape Contracts Pending

5100 tons, including 2600 tons of piling, dam, Muscatine, Iowa; bids Nov. 27 to United States engineers, Rock Island, Ill.; project also includes 1250 tons of reinforcing material.
3000 tons, Lorain avenue bridge over Rocky river, Cuyahoga county, O.; bids Nov. 16 to state highway commission, Columbus, O. Increased from 2000 tons previously reported as required.
2500 tons, bridge, Monroe and Alexander, La.
1200 tons, Leechburg, Pa., bridge; Freeland, McHale & Patten, Pittsburgh, low.
950 tons, gate frames, Wheeler dam, Sheffield, Ala., for Tennessee valley authority, Washington.
825 tons, psychopathic ward, general hospital, San Francisco; Judson-Pacific Co., San Francisco, low bidder.
750 tons, aqueduct, Los Angeles; general contract placed.
738 tons, bridge, Carthage, Tenn.
625 tons, three state bridges, Missouri.
600 tons, bridge, Colorado Springs, Colo.
425 tons, bridge, Malvern, Kans.
410 tons, laboratory building for Willard Parker hospital, New York.
350 tons, bridge, Clay Center, Kans.
280 tons, I-beams, angles and tees, black and galvanized, bureau of supplies and accounts, navy department, Washington, for delivery to Portsmouth, N. H., (Kittery, Me.) and Mare Island, Calif.; bids Nov. 16, schedule 3661.
190 tons, bridge for Toledo Terminal railway, Toledo, O.
175 tons, repairs to elevated railway, stockyard district, Chicago.
125 tons, two traveling cranes, specification 1530 for Los Angeles; bids opened.


World's Champion
STEAM PRODUCER

uses Sturtevant FANS · TURBINES · GEARS

*1,250,000 pounds of steam per hour generated by each of last 3 boilers*

There are 33 Sturtevant Draft Fans in this record-breaking East River Station of the New York Edison Company. Total capacity—13,514,500 pounds of air and gas per hour.

Two Sturtevant Forced Draft and two Sturtevant Induced Draft Fans are used for each boiler. Each fan is driven by a Sturtevant Steam Turbine through a Sturtevant Gear, all three units being mounted on a common base.

The last three boilers installed in this station broke the world's record for steam production. Each of these Combustion Engineering Company boilers, served by Sturtevant Fans, was guaranteed to produce 800,000 pounds of steam as a maximum. Each actually reached 1,250,000 pounds per hour!

B. F. STURTEVANT COMPANY

Main Offices: Hyde Park, Boston, Mass., Chicago, Ill., 400 North Michigan Avenue, San Francisco, Cal., 681 Market Street

*Branch Offices in Other Cities*

DRAFT FANS . TURBINES . GEARS ECONOMIZERS . AIR HEATERS


# Reinforcing

**Reinforcing Bar Prices, Page 73**

**Chicago**—All bids on the 18,000 tons of bars for the Ft. Peck, Mont., dam have been rejected and new figures will be tken Nov. 12. The Muscatine, Iowa, dam across the Mississippi river will take 1250 tons of bars with bids closing at Rock Island Nov. 27. These two projects lead in the market which otherwise is quiet. Several hundred tons of bars for Illinois road work remain to be placed. Inquiries and orders for private work recently have been quiet.

**Pittsburgh**—Reinforcing bar demand is made up of small lots, and other than minor private jobs frequent state highway lettings predominate. The market continues 2.05c, Pittsburgh, on new billet bars in cut lengths.

**Cleveland**—New projects issued for bids by the Ohio highway commission, Columbus, are becoming more frequent, recently averaging about 200 tons of concrete bars weekly. Included in work on bids Nov. 2 and 9 are 210 tons, the largest 160 tons for a bridge near Waverly, O. Sellers are booking small, miscellaneous lots, with volume considerably below expectations.

**Boston**—Bridges account for most of the pending reinforcing bar requirements. A state bridge, Dennis-Yarmouth, Mass., will take close to 250 tons. Highways and bridges in Connecticut will require several hundred tons.

**New York**—Two fabricators share

in the 650-ton award for the Harts Island piers, Tri-boro bridge, New York. New inquiry is light, the bulk of pending reinforcing steel requirements being for highway mesh. Billet bar prices are unchanged with cut lengths delivered to the job 2.48c in the New York city district.

**Philadelphia**—The market here is quiet, but in Georgia 2500 tons are active for two PWA projects, one being a jail at Reedville, up for bids Nov. 20, taking 950 tons, and the other the Georgia technical college housing development in Atlanta, bids Nov. 15, requiring 1600 tons.

**San Francisco**—Concrete bar awards for the week totaled less than 500 tons. To date this year, however, 93,293 tons have been booked as compared with 59,658 tons for the corresponding period in 1933. Pending business on the Pacific coast now exceeds 65,000 tons, including 45,000 tons for the Los Angeles aqueduct and 12,500 tons for the Grand Coulee dam, Almira, Wash.

**Seattle**—The market is quiet with no sizable specifications pending, except the 12,500 tons for the Coulee dam project. Public road works is taking only small lots. An unstated tonnage is involved in the Science building, Washington state college, Pullman, for which Ross B. Hammond Co., Portland, is low.

## Reinforcing Steel Awards

650 tons, piers, Tri-boro bridge, Harts Island, New York; 400 tons to Capital Steel Co., Brooklyn, N. Y., and 250 tons to Igoe Bros., Newark, N. J.; Woodcrest Construction Co., New York, general contractor.

300 tons, substructure, St. Louis postoffice, to Laclede Steel Co., St. Louis.

250 tons, state highway bridge, Nebraska, to Omaha Steel Works, Omaha, Nebr.

200 tons, bridge, Donaldson, Ark., to Arkansas Foundry Co., Little Rock, Ark.

201 tons, mesh, highway, St. Lawrence county, New York, to Truscon Steel Co., Youngstown, O.; Louis Mayersohn, Albany, N. Y., general contractor.

150 tons, medical building, Wilshire and Lucerne boulevards, Los Angeles, to unnamed interest.

100 tons, 25th and Chestnut street school alteration, Long Beach, Calif., to unnamed interest.

## Concrete Awards Compared

| | Tons |
|---|---|
| Week ended Nov. 3 | 1,851 |
| Week ended Oct. 27 | 2,235 |
| Week ended Oct. 20 | 3,531 |
| This week in 1933 | 3,533 |
| Weekly average for 1933 | 3,232 |
| Weekly average, 1934 | 4,486 |
| Weekly average, October | 3,229 |
| Total to date, 1933 | 160,177 |
| Total to date, 1934 | 201,890 |

## Reinforcing Steel Pending

18,000 tons for the Fort Peck, Montana, dam, award delayed because army engineers at Kansas City, Mo., have rejected bids for the general contract for dam. Contract for excavation has been awarded.

1250 tons, dam, Mascatine, Iowa; bids Nov. 27 to United States engineer, Rock Island, Ill.

275 tons, state bridge, Bass river, Dennis-Yarmouth, Mass.; bids in.

210 tons, Ohio state highway work, including 160 tons for bridge near Waverly; bids to state highway commission, Columbus, Nov. 2 and 9.

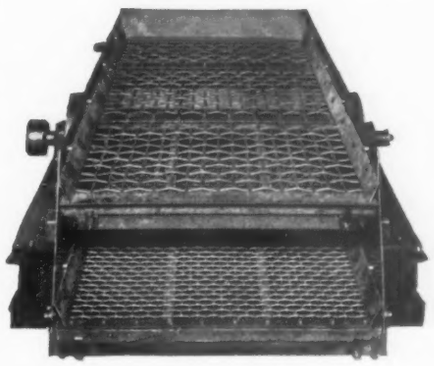
184 tons, psychopathic ward, general hospital, San Francisco; Gunn, Carle & Co., San Francisco, low.

111 tons, state highway work, Santa Barbara county, California; bids opened.

100 tons, state crossing, Kern county, California; bids opened.


BUFF-ALOY

High Abrasion Resisting WIRE CLOTH



A brand new screen development, especially adapted for screening abrasive materials or particularly hard usage.

For years we have been experimenting and developing "BUFF-ALOY", during which time—"BUFFALO" ROK-TEX Wire Screens have been giving greater results than other wire screens on the market for this purpose.

Now we present a further development in a Wire Screen which we have christened "BUFF-ALOY" and which is as great an improvement over "ROK-TEX" as "ROK-TEX" was over ordinary Steel Wire Cloth.

"BUFF-ALOY" is made from a special alloy wire developed in our own laboratories, by our engineers, with the object in view of cutting down replacement costs—and giving the consumer a perfectly developed "ABRASIVE RESISTING SCREEN".

For your next requirements give "BUFF-ALOY" a trial. You will come back again for more.

Full information and prices furnished upon application with sizes and specifications of your requirements.

*Write for "BUFF-ALOY" Folder No. 101-A*

We also operate our own galvanizing plant and do job galvanizing.

BUFFALO WIRE WORKS CO.

INCORPORATED

(Formerly Scheeler's Sons)

*Established 1869*

437 Terrace BUFFALO, N. Y.

*Philadelphia Office and Warehouse:* 11 South 7th Street

## Strip Steel

Strip Prices, Page 73

**Pittsburgh**—An increasing number of small orders, mainly for a wide variance of tempers and sizes, in hot-rolled strip has sustained the market so that October specifications were slightly ahead of September. Little noteworthy improvement has been established in the cold strip market. Prices are steady at 1.85c for hot and at 2.60c for cold strip. Bids on 723 tons of steel sealing strips for the Fort Peck, Montana, dam spillway will be readvertised for Nov. 12 by Kansas City army engineers, original bids having been rejected.

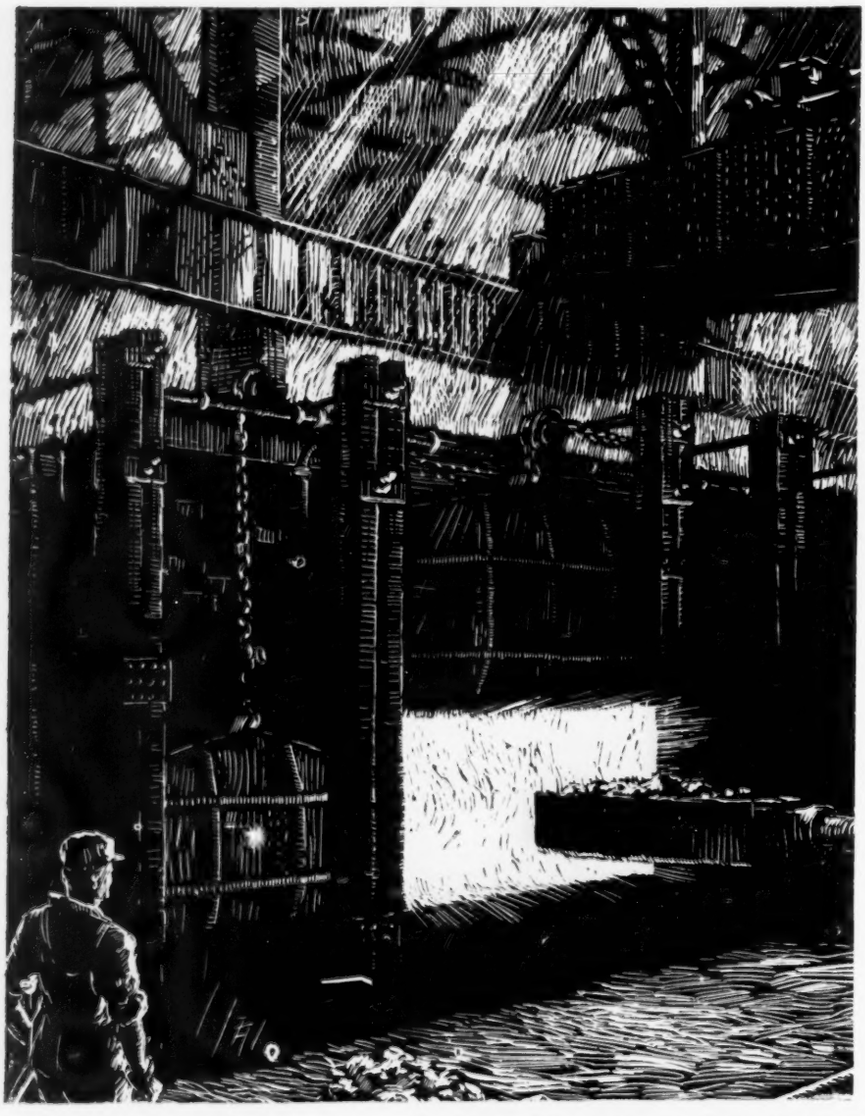
**Cleveland**—General Motors, Chrysler and Ford have distributed some fairly good orders for strip and sheets, preliminary to heavier buying this month. Demand from partsmakers also is more active. Chrysler is reported to have placed a contract with Midland Steel Products Co., Detroit, for chassis frames requiring several thousand tons of strip. Manufacturers of articles for the Christmas trade, usually active at this season, are slow buyers.

**Chicago**—Strip demand is improving slowly, principally as a result of expanding requirements of the automotive industry. The outlook for heavier needs of other strip consumers is less favorable although demand recently has been well maintained.

**Boston** — Cold-rolled strip buying has improved slightly with an increase in miscellaneous orders for early delivery. Little gain has been made by hot-rolled.

**New York**—While toy and electrical manufacturers are doing some last-minute buying for the holiday trade business shows no bulge in otherwise listless demand for steel strip. Prices are unchanged.

**Philadelphia**—The market is quiet, and prices are unchanged.



LUMP ORE FOR OPEN HEARTHS
IRON ORE • PIG IRON • COAL
COKE ALLOYS
THE CLEVELAND-CLIFFS IRON CO., CLEVELAND, O.

## Wire

Wire Prices, Page 73

**Pittsburgh** — Establishment of the high-carbon spring wire market at 2.90c, Pittsburgh or Cleveland, a reduction of $6 a ton from the former 3.20c base, is in effect Nov. 5, and is reported to have been made to care for an unusual circumstance which does not affect the other wire grades, where prices are steady. Buying of wire products, especially manufacturers' wire, features a larger number of small-sized orders with few commitments being of carload size or larger.

**Cleveland**—Business in wire and wire products is holding at the recently improved level. Nut and bolt manufacturers have not increased their orders, mainly because of their raw material and manufactured stocks. Specialty manufacturers are placing fairly good orders. Some wire interests are preparing for early spring demand from agricultural districts.

**Chicago**—Wire sales are improving slowly. The recent reduction of $6 a ton in spring wire to 2.95c, Chicago, has not affected quotations on other wire materials.

**Boston** — Slight, irregular improvement marks demand for wire products. Several large consuming outlets still are curtailed, notably textiles. Smaller dealers have generally liquidated stocks, but some large jobbers have fair inventory.

# Pig Iron

Pig Iron Prices, Page 74

**Cleveland**—Sales continue to improve moderately, and are featured by some larger individual orders. Two lots, each of 1000 tons, were booked here during the week. Encouraging developments are noted in radiator and domestic stove manufacture, aided by federal home renovizing loans. Automobile foundries show consistent progress. October closed with shipment for the month 50 per cent over the tonnage moved in September. Corrigan, McKinney Steel Co. here has lighted the second of its four blast furnaces, mainly for its steel mill requirements.

**Pittsburgh**—Slight improvement in foundry pig iron shipments recorded recently diminished last week and several melters appeared to be out of the market at least temporarily. Westinghouse Electric & Mfg. Co. has discontinued its steel foundry at East Pittsburgh, Pa., although continuing the gray iron foundry. Patterns and other facilities at the steel foundry division have been moved to the plants of several district independent foundries. The market continues at $18.50 here for No. 2 foundry and malleable grades. Bessemer analyses are quoted $19.00 and basic $18.00.

**Chicago**—October was the most active month in pig iron shipments since June and showed a 35 to 40 per cent increase over September. Further gains are in prospect this month as consumers are making additional cuts in stocks accumulated earlier this year. The market continues $18.50, furnace, for No. 2 foundry and malleable.

**Boston**—Pig iron sales are limited to small lots, consumers filling requirements by truck shipments in numerous instances. Foundry melt is light with jobbing plants and producers of heating units making the best showing.

**New York**—Jobbing foundries in this district have increased operations slightly to about 30 per cent of capacity, on the average, with an accompanying small increase in pig iron specifications.

**Philadelphia** — Specifications for pig iron are light and scattered, with little improvement noted in the daily melt.

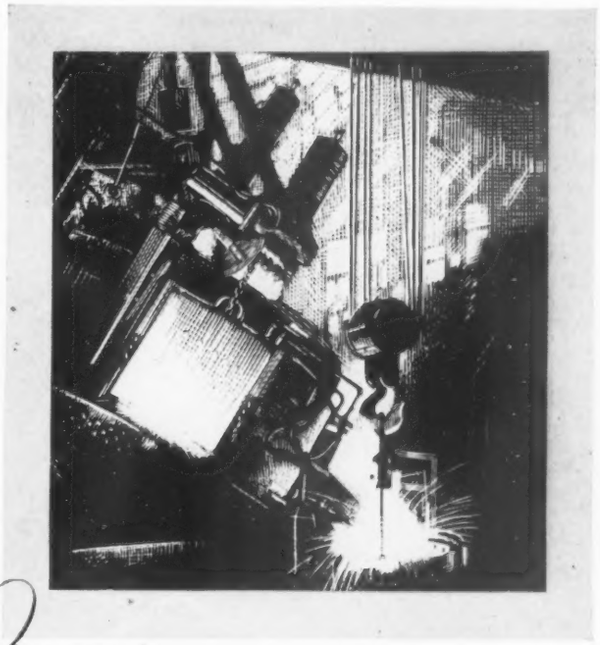
**Buffalo**—October was a better month for sales and shipments of iron than any 30-day period of the third quarter, Buffalo producers report. A steady buying movement from all classes of the consuming trade continues although individual purchases are small.

**Cincinnati**—Pig iron demand is restricted to small lots as melters aim to hold inventories low. Current operations of stove foundries are considered seasonally good.

**St. Louis**—October pig iron business totaled the highest since June, shipments exceeding those of September by nearly 100 per cent. Most sales are foundry iron, with stove, jobbing foundry and farm implement plants absorbing the major part of the tonnage. Shipments are fairly well distributed between northern and southern interests.

**Birmingham, Ala.**—Shipments are made up of numerous small lots, total business being less than production. A current report that a large quantity of iron had been purchased for future delivery is not verified.

**Toronto, Ont.**—Melters show no

A *Pioneer* IN ELECTRIC FURNACE STEEL

When electric furnace steel was still thought to be in an experimental stage — before the alloy steel business had assumed its present importance — Ludlum had the courage to discard its old equipment, and confine production exclusively to electric-furnace steels. This break with the past . . . this daring to stake its future on a new range of products—is typical of Ludlum.

. . . . Pioneering in electric furnace steel quickly placed Ludlum as a leader in the modern development of alloy steels whose many possibilities could be only realized with the close control afforded by the electric furnace.

Typical of Ludlum leadership is the part it has taken in the development of Nitralloy and the nitriding process. Nitralloy is today widely used in the crucial parts of engines, motors, valves, pumps and machinery of all kinds where strength and resistance to wear are paramount requirements. A metal, tough, highly resistant to shocks yet which can be easily forged, rolled, machined . . . a metal which resists rust and atmospheric corrosion . . . and above all a metal with a surface harder than glass!

Ludlum is proud of its 80 years of steady progress, but prouder of its alert research, its trained engineers and metallurgists, able and eager to assist any metal fabricator in the selection and use of the alloys, tool steels or stainless steels best suited to his individual needs. The experience of this staff and its fund of up-to-date technical data may be yours upon request. Address the Research Department, Ludlum Steel Company, Watervliet, New York.

NRA CODE

LUDLUM STEEL COMPANY—WATERVLIET—NEW YORK
TOOL STEELS—SILCROME—NITRALLOY

LUDLUM

*Makers of Fine Steels Since 1854*

interest beyond current needs. Production is sustained and prices unchanged.

# Scrap

Scrap Prices, Page 75

**Chicago**—Iron and steel scrap prices are unchanged and demand from mills continues light. Shipments against contracts are slightly heavier but most consumers are not interested in building up stocks. Offerings by railroads are larger. Foundries are moderately active in scrap buying but new orders from mills are few. Heavy melting steel continues $8.50 to $9.

**Pittsburgh**—Failing to reflect any further advances in mill buying prices, the market was quotably unchanged last week, but retained its strong characteristics. Awaiting mill buying developments, No. 1 heavy melting steel is quoted $10.75 to $11.25 here, machine shop turnings $7.00 to $7.50 and railroad steel specialties $13.50 to $14.00. New York Central closed Oct. 31 on 89 cars of No. 1 steel and the Pennsylvania railroad is asking bids until Nov. 7 on 6550 tons of heavy melting steel, 3250 tons of iron wheels and several thousand tons of scrap rails.

**Cleveland** — Inactivity continues in the steel and iron scrap market as melters show no interest.

**Boston** — Heavy melting steel prices for export are stronger, $7.75 to $8, dock, being paid for No. 1 with No. 2 moving at $6.50 to $7. Domestic activity is light as consumers decline to meet export prices.

**New York**—Slightly firmer prices for scrap in eastern Pennsylvania have failed to attract shipments from this territory as delivered prices are still too low to divert tonnage of melting steel from export. An eastern Pennsylvania melter paid $10, delivered, for breakable cast, but little from this area will apply on the purchase.

**Philadelphia** — Sentiment in the steel and iron scrap market is stronger, with advances in several grades. No. 1 heavy melting steel is up 25 cents, to $9.75 to $10, with a moderate tonnage to an eastern Pennsylvania melter at $10. Sale of about 60 cars of hydraulic compressed bundles by a producer here brought slightly over $10, but it is understood it was bought for export.

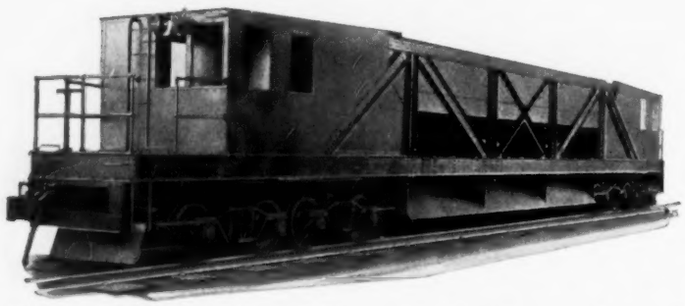
**Buffalo**—Active markets have developed for cast and stove plate but other grades are moving in small volume. Stove plate sold at $8.75 for local delivery and cast at $9.50 to $10.50. Dealers offer $8.25 for No. 2 heavy melting steel, practically the only activity in this line. Large receipts of turnings and borings from Detroit continue to depress the local market. Prices are holding steady for most grades.

**Detroit**—Scrap prices have advanced 25 to 50 cents a ton, with No. 1 heavy melting steel up 25 cents at $7.75 to $8.25. Some tonnage has been sold a local consumer at the latter figure. Offerings by automobile plants are light, due to the low rate of operations but prices bid on such tonnages show a definite upturn over levels of 30 days ago.

**Cincinnati** — Without improvement in activity, the iron and steel scrap market gained strength during the past week. Prices are unchanged on scattered, small lot trading.

**St. Louis** — While purchasing of iron and steel scrap has not im-


ATLAS ORE TRANSFERS



*100 ton—3 compartment Ore Transfer. Roller Bearing Journals. Double end control for car operation. Individually operated discharge gates.*

OTHER ATLAS PRODUCTS

Gas-Electric and Diesel-Electric Locomotives . . . Electric Transfer Cars for Blast Furnaces and Steel Plants . . . Stockhouse Scale Cars for Blast Furnaces . . . Concentrate and Calcine Cars for Copper Refineries . . . Automatic and Remote Controlled Electric Cars . . . Pushers, Levellers and Door Extractors . . . Coal Charging Lorries, Coke Guides and Clay Carriers . . . Atlas Patented Coke Quenching Cars for By-Product Coke Ovens . . . Atlas Patented Indicating and Recording Scales . . . Special Cars and Electrically Operated Cars for every conceivable Purpose

THE ATLAS CAR & MFG. CO.

*Engineers . . . Manufacturers*

CLEVELAND, OHIO

proved, the undertone is firmer and renewed buying and an upturn in prices is expected during the next two or three weeks.

**Birmingham, Ala.**—Heavy melting steel is moving slowly, in small lots, at $8. Demand is light and the situation offers no features.

**Seattle**—Softness in Japanese exchange is affecting scrap buying and the market is quiet. Oriental buyers refuse to raise prices and sellers are unwilling to sell at a discount. Prices are off about 50 cents.

**Toronto, Ont.**—Trading in iron and steel scrap continues specialized, with only small lots moving. Shipments to the Hamilton, Ont., district are practically at a standstill, but mills at Sydney, N. S., are taking delivery on scrap, most coming from the United States. Current demand runs largely to iron grades and there is a steady small tonnage call from Ontario foundries.

# Warehouse

**Warehouse Prices, Page 76**

**Pittsburgh** — October warehouse steel shipments exceeded those of September slightly, in the experience of local jobbers. Small orders predominate. Prices are unchanged.

**Cleveland**—September and October were disappointing months for warehouses. Last month was a shade better than the former, due to a slight improvement in the final week. General construction work still lags.

**Chicago**—October sales were nearly 10 per cent ahead of September volume, the past month being one of the best of the year.

**New York**—Improvement in demand for steel out of warehouse which developed several weeks ago has been maintained. Prices are firm and unchanged.

**Philadelphia** — Warehouse demand showed some gain in October, with current volume moderate.

**Detroit**—Sales are steady, October comparing favorably with the best months of the year. Prices are unchanged.

**Cincinnati** — Industrial demands for steel from warehouse during October were slightly below the preceding month, but total tonnage showed little variation.

**St. Louis**—While demand for materials out of warehouse did not show the full seasonable expansion in October, sales for that month were measurably ahead of August or September.

**Seattle**—Sales are in small lots. Following a heavy storm during the week there was a temporary demand for plates and corrugated sheets for repairs.

## Nonferrous Metals

**Nonferrous Metal Prices, Page 74, 75**

**New York**—Sentiment in the domestic copper market strengthened last week and most other metal prices maintained an even tone. Prime western zinc displayed easiness, however, while antimony has firmed.

**Copper**—Primary producers agreed to waive November sales quotas. This action placed the marketing provisions of the code in a strong position to withstand any lack of improved buying over the October rate. Domestic demand increased with prices generally unchanged, although casting copper eased to 7.37½c, f.o.b. refinery, due to weakness abroad.

**Zinc**—Prime western zinc prices


GALVANIZED ROOFING

**Before buying any kind of roofing material for your house, garage, barn, corn crib, machine shed, hog pen, chicken house or other buildings consider these advantages.**

**ECONOMY** - - Low initial cost. Dependable service.

**EASE OF APPLICATION** - Lays rapidly. A hammer and pair of extra heavy scissors commonly called "Tinner's Snips" are all of the tools needed.

**DURABILITY** - With proper care will last a life time.

**LIGHTNING-PROOF** - If properly grounded.

**BAFFLES FIRE** - Tends to retard any internal blaze as well as preventing the spread of flames from one building to another.

**SANITARY** - - Water shed is clean and suitable for cistern and other purposes.

**The PARKERSBURG IRON and STEEL COMPANY**

*Manufacturers of*

Sheet Steel Roofing Products — Black and Galvanized Sheets — Stove Pipe — Stove Pipe Elbows — Dripping Pans — Walnut Grained and Galvanized Unlined Stoveboards

*General Offices*—Parkersburg, W. Va.

*Branch Offices* — Pittsburgh, Pa., San Francisco, Cal., Memphis, Tenn. Charlotte, N. C. and Roanoke, Va.

were unsettled and ranged from 3.80c to 3.85c, East St. Louis, for delivery over the balance of the year. Quiet price shading was noted in the market.

**Lead**—Sales declined from their recent active pace but was generally expected in the trade in view of the large bookings for October. The price level has been steady with American Smelting quoting 3.70c, New York, and with St. Joseph Lead Co. asking $1 a ton premium on both New York and East St. Louis bases. Estimates still place October sales around 38,000 tons, or larger than those of September.

**Tin**—Consumers continued to show slight buying interest with sales confined to small lots. Prices were fairly steady fractionally over 51.00c. The rate of pound sterling exchange against the dollar was the chief price factor during the week.

**Aluminum**—Market was quiet with metal available at 19.00c.

**Antimony**—Supported by higher prices in China, the market firmed up to 10.12½c, duty paid, for spot. Supplies of Chinese metal here are still restricted.


CRANES, BUILDINGS and EQUIPMENT SALVAGED FROM EMPIRE MILLS AT NILES

**A Combination of Circumstances!**

**The least of which is not the race with cold weather. This dismantling work will not be drawn out indefinitely, all items must be sold at once. Your interest can be best protected by negotiating at once for any items in which you may be interested.**

| | |
|---|---|
| 5—156" Hyde Park Shears Motor Driven, each | $850.00 |
| 1—156" Hyde Park Knife Grinder | 1,500.00 |
| 2—1200 H.P. Hot Mill Drives G.E. Motors, with Control, Falk Gears, each | 10,000.00 |
| 1—400 H.P. Cold Roll Drive G.E. Motor, with Control, Falk Gear | 5,000.00 |
| 2—35 Ton Morgan Cranes 57' Span, each | 2,200.00 |
| 2—25 Ton Morgan Cranes 48' Span, each | 1,200.00 |
| 1—10 Ton Morgan Crane 57' Span, each | 1,000.00 |
| 1—300 K.W. Motor Generator Set | 2,500.00 |
| 1—360 K.W. Motor Generator Set | 3,000.00 |
| 6—Dial Scales, 5 ton capacity, each | 100.00 |
| 3—150 K.V.A. Westinghouse Transformers 22,000-2,300, each | 200.00 |
| 1—300 K.W. Crocker-Wheeler Steam Generator | 800.00 |
| 1—220 K.W. Buckeye Steam Generator | 700.00 |
| 1—10' 6" Wellman Gas Producer Unit | 3,000.00 |
| 2—R.R. Track Scales, each | 350.00 |
| 50—Niles Factory Wagons, each | 10.00 |
| 1—65' x 275' Steel Building with 10 H.P. P & H Crane | 3,500.00 |

Other Buildings priced at sacrifice prices $25.00 per net ton, F.O.B. cars, Niles.

*All prices net F.O.B. cars, Niles, Ohio*

**HETZ CONSTRUCTION CO.**

Salvage Dept. — Phone 1203

NILES, OHIO


## Bolts, Nuts, Rivets

**Bolt, Nut, Rivet Prices, Page 73**

Notwithstanding the recent reduction in nuts and bolts, amounting to an additional discount of 10 per cent, made by leading producers in the hope of stabilizing the market, it is understood some smaller interests are offering still further concessions. The present official discount is 70-10-10-10 off list, small rivets 70-5 off and large rivets 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago.

Jobbers' orders have improved slightly, but releases from automobile manufacturers still are slow, while railroads are buying only small lots.

## Tin Plate

**Tin Plate Prices, Page 72**

**Pittsburgh**—Contract prices on tin plate for 1935 are expected to be announced about Nov. 20. The present market is $5.25, Pittsburgh, per base box. Tin mill operations for the industry are no better than the rate of a leading interest which is at 35 per cent. Canmakers are working down their stocks.

## Semifinished

**Semifinished Prices, Page 73**

Semifinished steel demand continues. This has become evident especially in sheet and tin bars where the nonintegrated rollers of sheets and tin plate have had such small backlogs that they have not accumulated stocks. A few automotive shops are buying billets. On a Pittsburgh base, sheet bars hold at $28; billets $27; and wire rods $38.

## Metallurgical Coke

**Coke Prices, Page 73**

Only by-product and beehive coke for domestic use show activity and metallurgical grades continue to suffer by foundries buying from hand to mouth. Connellsville oven beehive producers still quote furnace grades at $3.85 for immediate shipment with a 25-cent deduction for contracts. There has been no change in foundry grades at $4.60 a ton for common brands and $5.10-$5.35 for premium foundry coke.

Shipments of by-product foundry

coke at Chicago were 25 per cent larger in October than in September, deliveries being the best since March. The price is unchanged at $8.50, ovens, for outside delivery, and $9.25, delivered, Chicago. St. Louis deliveries were larger in October. At Cincinnati foundry melt has held deliveries steady. Birmingham, Ala., producers find demand steady at a low rate.

## Steel in Europe

**Foreign Steel Prices, Page 76**

**London** — (*By Cable*) — Specifications for heavy steel products are increasing in number in all districts of Great Britain, but no large tonnages have been placed. Shipbuilders in Scotland and on the northeast coast have booked contracts for small cargo vessels. Demand for structural steel is expanding, especially in the Midlands and the South. Tin plate output has advanced 70 per cent. Financial conditions in South America are stimulating exports of Welsh tin plate.

The decision to close French steelworks has been revoked in view of possible contracts from the unemployment relief program. German exports in recent months show an increase of 35 per cent over 1933.

## Iron Ore

**Iron Ore Prices, Page 74**

**Cleveland**—Final figures on Lake Superior iron ore shipments for October are 2,640,823 tons, compared with 3,439,375 tons in September, and 4,542,510 tons in October last year. For this season to Nov. 1 shipments total 21,765,409 tons. Total shipments in 1933 were 21,600,000 tons.

## Coke By-Products

**Coke By-Product Prices, Page 73**

**New York**—Current production of distillates, which is light, is moving directly into consumption, with prices firm. Stocks of toluol and benzol are barely able to meet demand. Naphthalene buying is slow and limited to spot requirements. Phenol is slightly more active at unchanged prices, while sulphate of ammonia demand holds to the recent rate.

## Quicksilver

**New York**—Quicksilver prices are unchanged in a quiet market. Small lots are $74.50, a virgin flask, and round lots down to $73.50.

## Production

(*Concluded from Page* 18)

eight are in blast for Steel Corporation subsidiaries.

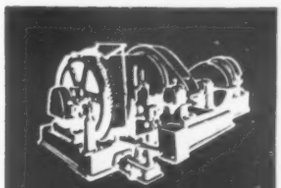
**Wheeling**—Up 2 points to 31 per cent last week, with no change in steelmaking schedules expected this week. Melting rates involve 12 out of 39 open-hearth furnaces in the three district plants.

**Birmingham**—Advanced 15 points to 25 per cent last week, due to several open hearths being put in production. This rate will probably be maintained for a time. Sheet, wire and wire products are moving fairly steady, while structural and plate

WELLMAN EQUIPMENT

› FOR IRON
› AND STEEL
PRODUCTION

Steel Mill Equipment . . Coal and Ore Handling Equipment . . Car Dumpers, all types
Williams Buckets and Trailers . . Gas Producers, Flues, etc. . . . Gas Reversing Valves
Blast Furnace Skip Hoists . . Safety Stops for Traveling Structures . . Special Cranes
Port and Terminal Equipment . . Castings and Machine Work to customers' drawings



When you are in the market for material handling and production equipment, consult Wellman—for Wellman has done more to promote real efficiency and economy than any other manufacturer serving the iron and steel industry.

THE WELLMAN ENGINEERING CO.
ENGINEERS CONSTRUCTORS MANUFACTURERS
CLEVELAND, OHIO
BIRMINGHAM • NEW YORK • MEXICO CITY
WELLMAN

fabrication work is not so active.

**Buffalo**—Increased 2 points to 26 per cent last week. Ten out of 38 open hearths are now in production, one more than the maximum reached at any time in the third quarter. No immediate revision of production schedules is planned by any of the local works.

**Detroit**—Steady at 59 per cent last week, with no immediate change expected. Eleven open hearths continue in operation here, one mill scheduling four and another seven.

**Cleveland-Lorain** — Unchanged at 38 per cent last week, Corrigan, McKinney Steel Co. lighted its seventh open hearth, but National Tube Co., Lorain, took off two, operating six. Otis Steel Co. continued with two.

### CANADA MAKES MORE IRON

Pig iron production in Canada for September totaled 43,019 tons, a 3 per cent increase over the August total of 41,485 tons, and a 40 per cent increase over the September, 1933, figure of 30,738 tons. Basic iron increased to 36,804 tons from 28,844 tons in the previous month, while foundry iron dropped from 7831 tons to 4597 tons, and malleable iron declined from 4810 tons to 1618 tons.

Output of ferroalloys was 1147 tons, compared with 2458 tons in August, and 2033 tons in September, 1933.

September output of steel ingots and direct steel castings, totaled 57,489 tons, compared with 63,504 tons in August. September production, however, showed an increase of 44 per cent over the total of 38,630 tons recorded for the corresponding month last year.

For the first nine months, pig iron production totaled 279,090 tons, or more than double the total of 133,870 tons for the corresponding period of 1933. Ferroalloys output stood at 18,224 tons, against 11,195 tons, while production of steel ingots and castings was 585,162 tons, compared with 266,829 tons a year ago.

## Equipment

**Pittsburgh**—Rust Engineering Co., Pittsburgh, has been awarded contract for foundations of the new cold strip mill for Youngstown Sheet & Tube Co., Youngstown, O. The Rust company is now completing the foundations for the adjoining hot strip mill, construction of which was begun several months ago. Steel Industries Engineering Corp., Pittsburgh, last week closed on an electric rotary clay gun for the Hanna Furnace Corp., Detroit. Several steel companies in the Pittsburgh district have been buying ingot molds in unusually conservative fashion recently, preferring to buy single molds rather than complete sets.

**New York**—Inquiry for machinery is slightly heavier and considerable volume is being figured. Purchases, however, are largely for equipment needed for demands created by federal contracts or loans, notably for technical schools, New York, arsenals and the navy. For arsenals, in addition to a large list of tools, bids are being taken on heat treating equipment. There has also been a better inquiry for overhead cranes in the East, with some buying.

**Chicago**—October recorded few changes in sales of machinery and equipment despite some improvement in number of inquiries. Machine tool orders were better than the extremely low volume of September, although little increase was noted in the immediate Chicago district. While the trend of inquiries presages future betterment in demand, general uncertainty in business is blamed for slowness in closing on orders. Action is expected soon on proposed purchases of a large volume of tools and equipment for the Rock Island, Ill., federal arsenal. Railroads continue inactive buyers. Absence of inquiries from the carriers for price-determination purposes in preparation of 1935 budgets is taken to indicate that budget plans are uncertain.

**Cleveland**—Outlook in the machinery and equipment fields, while it does not hold promise for a rush of business, at least is not discouraging. A steady flow of orders for smaller items and replacement parts is being received. October was a better month than September, although considerably below the level of a year ago. A motor builder in the northern Ohio district is reported to be planning expansion of operations.

**Bulletin**

**PITTSBURGH — United Engineering & Foundry Co. here has definitely been awarded contract for the 42-inch continuous strip mill it has been figuring for the McDonald, O., works of Carnegie Steel Co.** **(see p. 16).**


**STRIP STEEL**
**HOT and COLD ROLLED**

**in regular carbon Steel of any analysis including alloy steels**

**also**
**STAINLESS METALS**
**in**
**CHROME and CHROME NICKEL analyses**

**SUPERIOR STEEL CORPORATION**

*General Office*
3122 Grant Building
Pittsburgh, Pa.

*Works at*
Carnegie, Penna.

SALES OFFICES

2002 Girard Trust Bldg.
Philadelphia, Pa.

1017 Fisher Bldg.
Detroit, Mich.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

# Construction and Enterprise

## New York

BROOKLYN, N. Y.—Royal Metal Box Corp. has been organized to manufacture metal containers, by Roy Halper and Samuel Halper, 238 Forty Sixth street, Brooklyn, N. Y.

BROOKLYN, N. Y.—Monrow Coal & Coke Service, 324 Fiftieth street, has bought a site in the Bush Terminal district and will erect a coal pocket, including conveying and elevating machinery.

BROOKLYN, N. Y.—Economy Hy-Heat Coal Co. Inc., 654 Kent avenue, has obtained a site at Flushing, L. I., 100 x 150 feet, and will build coal pockets, equipped with elevating and conveying machinery, at cost of about $30,000.

IRVINGTON, N. Y.—City plans construction of a waterworks system to cost about $53,000, on PWA funds. W. C. Jago, 16 South D street, Irvington, N. Y., is engineer.

ITHACA, N. Y.—Triangle Electric Co. has been organized to manufacture electrical devices, by L. D. Allen, 716 North Cayuga street, and associates.

LONG ISLAND CITY, N. Y.—Goldsmith Bros. Smelting & Refining Co., 74 West Forty-sixth street, New York, plans construction of a 53 x 200-foot smelter and reduction plant on Twelfth street, to cost $28,000, with equipment.

MINEOLA, L. I., N. Y.—Gregor Aircraft Corp. has been formed to manufacture airplanes and parts, by M. A. Schectman, 70 Pine street, New York.

NEW YORK—North American Die Works, 35 Great Jones street, has leased space for a plant at 10 Washington street.

NEW YORK—General Foods Corp., 250 Park avenue, plans to install motors, controls, conveyors and other equipment in connection with extensions and improvements in various plants at cost of about $300,000.

ROCHESTER, N. Y.—Leech Steel Corp., Rochester, N. Y., has been awarded general contract for a $50,000 addition to the gelatin plant of the Eastman Kodak Co. A steel frame structure, 80 x 240, feet is planned.

SCHENECTADY, N. Y.—Department of sanitation, Boro hall, is having plans made for an incinerator for which $115,000 has been allotted by PWA. M. M. Cohen, Schenectady, is engineer.

## New Jersey

EAST ORANGE, N. J.—Whyte Spark Plug Co. has been organized to manufacture automobile accessories and spark plugs, by J. A. E. Whyte, Summit street and North Munn avenue. Capitalization is $125,000.

WOODBURY, N. J.—City plans complete electrification of its waterworks pumping station and installation of new equipment. A fund of $50,000 is available through federal aid. F. F. Kaufman, 909 Pine street, Camden, N. J., is consulting engineer.

## Pennsylvania

LATROBE, PA.—American Cyanamid & Chemical Co., 30 Rockefeller Plaza, New York, plans to rebuild its plant here, recently damaged by fire.

PITTSBURGH — Frozen Carbonic Corp., Neville Island, is having plans prepared by Hannah & Sterling, architects, Grant building, Pittsburgh, for a dry ice plant, 50 x 83 feet. New gas retorts and lime kilns are also under consideration.

PHILADELPHIA—Philadelphia Piers Inc., Pier 96, Delaware river, will build a 1-story storage shed 90 x 1000 feet, for which conveying and materials handling equipment will be required, entire cost to be about $75,000.

## Ohio

BLANCHESTER, O.—City council has plans, which have been approved, for a 150,000-gallon steel storage tank and watermains, to cost $25,000. Jennings-Lawrence Co., 12 North Third street, Columbus, O., is engineer.

MOUNT VERNON, O.—Home Oil Refining Co. has awarded contract for remodeling its refinery at Great Falls, Mont., to Ralph M. Parsons Co., Mt. Vernon, O. Construction will include latest type cracking unit. Additional boilers and equipment for vacuum distillation of asphalt will also be installed.

OAK HILL, O.—Village, L. C. Davis mayor, plans construction of a waterworks system, including three pumps, elevated steel tank and mains, to cost about $100,000, a PWA project. H. K. Bell, 132 McCleland building, Lexington, Ky., is engineer.

## Michigan

DETROIT—Detroit Name Plate & Etching Co., 684 East Congress street, is planning to erect a small factory building on East Larned street, Detroit.

DETROIT—Cadillac Paint Co., 433 Leland street, plans to alter and repair its factory here. Estimated cost $40,000.

GRAND RAPIDS, MICH.—Leonard Refrigerator Co., subsidiary of the Kelvinator Corp., Detroit, will install motors, controls, conveyors, heat-tretaing and other equipment in a new porcelain enameling plant, to cost over $100,000. (Noted Sept. 3.)

KALAMAZOO, MICH.—City has preparations under way for court house and jail to cost about $731,000, following the county supervisors' recent approval of the terms under which the federal government will advance the money. A $565,000 bond issue has been approved by voters for this purpose.

MORENCI, MICH.—An election will be held Nov. 10 on the question of issuing $20,000 in bonds for erection of a municipal waterworks. G. C. Daily, Morenci, Mich., is engineer. PWA aid is being considered.

MT. CLEMENS, MICH.—Mt. Clemens Tool & Gear Works Inc., has been incorporated to deal in tools, by Don E. Prior, 11731 Wyoming, Detroit.

PONTIAC, MICH.—Keller & Sipes Mfg. Co., 72½ North Saginaw street, has been incorporated to deal in iron and steel, by James L. Keller, Ferndale, Mich.

READING, MICH.—Acme Chair Co. is building a small factory addition.

ST. JOSEPH, MICH.—Nineteen Hundred Corp., Binghamton, N. Y., plans to install motors, controls, conveyors and other equipment in proposed additions to its plants at St. Joseph, Mich., and Binghamton, N. Y. at cost of about $100,000 (Noted Oct. 15).

WYANDOTTE, MICH.—Marx Brew-


CROSBY STAMPINGS

**Since 1896 the Crosby plant has been devoted, exclusively, to designing and producing Sheet Metal Stampings. Avail yourself of this experience. Send us your next stamping problem and watch results.**

**Manufacturers *IDEAL TROLLEY WHEELS***

THE CROSBY COMPANY

BUFFALO, N. Y.

***Branch Offices:*** **New York, Philadelphia, Pittsburgh, Cleveland, Detroit, Chicago.**

ing Co. is planning to modernize its plant and increase capacity, by extensive alterations and new equipment. A new bottling plant will be installed.

### Indiana

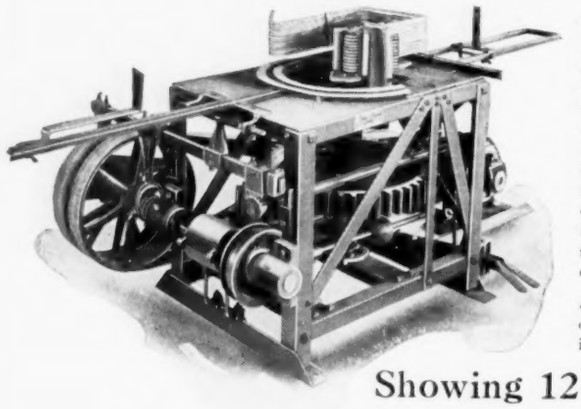
DECATUR, IND.—Central Sugar Co., D. W. McMillen, manager, has awarded contract for soy bean factory to Calland & Maddox, Decatur. New equipment, including dryers, expellers and filler processers will be needed. Estimated cost $28,500.

ELKHART, IND.—Superior Construction Equipment Co. of Indiana Inc., 1227 West Beardsley avenue, has been formed to manufacture machinery and construction equipment, by Will R. Sostheim, Osborne E. Quinton and Florence R. Kollock. Will R. Sostheim, Harrison hotel, Indianapolis, is resident agent.

INDIANAPOLIS—Safety Air Transportation Co. has obtained a site on Allisonville road on which it will erect an assembling plant for the manufacture of airplanes, at cost of $40,000, with equipment.

VALPARAISO, IND.—Lion Electrical Appliance Corp. has been formed to manufacture steel, metal, electrical and wood specialties, by Abe Lowenstine, John Lowenstine and H. I. Nicholas.


The Kardong Stirrup Bender



This bender is the result of our 20 years experience in the manufacture of reinforcing steel benders. One man can easily turn out four-bend stirrups from ⅜" stock at the rate of 300 or more per hour thus keeping labor costs at a minimum. A Handy bender for small slab bars and miscellaneous bending.

Ask for catalogue of our complete line of reinforcing steel Benders.

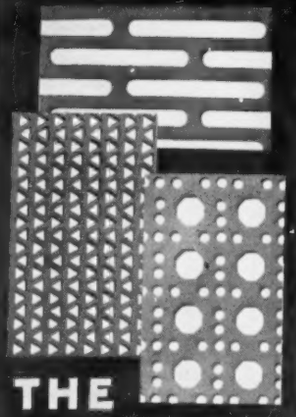
Showing 12 ⅜" stirrups bent in one operation

Kardong Brothers, Inc.

Minneapolis, Minn.



PERFORATED METAL



FOR EVERY REQUIREMENT

including Architectural Grilles, Safety Guards and Screens of every sort in Steel, Brass, Bronze, Copper, Zinc, Tin Plate, Monel, Lead, Stainless Iron, etc.

*Write for complete information*

THE HARRINGTON & KING PERFORATING CO.

5634 FILLMORE STREET—CHICAGO, ILL.

New York Office, 114 Liberty Street


### Illinois

ASHLAND, ILL.—Bids will be received Nov. 9 by the village for a waterworks plant to cost about $95,000, a PWA project. Warren & Van Praag Milliken building, Decatur, Ill., are engineers.

EAST FREEPORT, ILL.—Freeport Iron & Metal Co. warehouse, near river bank west of Commercial avenue, recently sustained damage by fire.

MATTOON, ILL.—PWA loan of $100,000 has been approved for a filtering and water softening plant, elevated steel storage tank and other waterworks improvements. J. A. Goetz is superintendent of waterworks.

PEORIA, ILL.—Hiram Walker & Sons, Peoria, Ill., are having plans prepared by Smith, Hinchman & Grylls, architects and engineers, Marquette building, Detroit, for construction of 3-story, 62 x 70-foot, evaporator building, in connection with distillery plant. Estimated cost $50,000.

WAUKEGAN, ILL.—Alexian Brothers hospital has plans for an electric light and power plant and will ask bids early in 1935 on equipment. Cost will be over $350,000. Maher & McGraw, 1564 Sherman avenue, Evanston, Ill., are architects.

WILLIAMSVILLE, ILL.—Bids will be received Nov. 8 by W. Patterson, president of the board of trustees, for a waterworks system to cost $47,000, a PWA project. Warren & Van Praag, Milliken building, Decatur, Ill., are engineers.

### District of Columbia

WASHINGTON—Chief of ordnance, United States army, will receive bids Nov. 20, circular 7, one automatic gear hobbing machine, one helical gear shaper, two high speed helical gear shapers, one 2-inch gear tooth rounding machine, one gear hobbing machine, one bevel gear generating machine; circular 10, 30 7-inch toolroom precision lathes, seven 8½-inch bench lathes and three 9-inch precision bench motor driven lathes; circular 3, 10 vertical drilling and tapping machines with mechanical feeds, one hydraulic ram drilling machine, two vertical drill presses, one horizontal drilling, boring and tapping machine, 21 bench type drilling machines and one high speed drill press.

### Florida

JACKSONVILLE, FLA.—Arnold Fruit Co., 414 West Bay street, is planning to establish a fruit packing plant, and will install modern packing house equipment. Total cost will be about $10,000.

WINTER PARK, FLA. — Emmett Nicholson Inc. plans expanding plant for manufacture of citrus packing house machinery, including installation of general machine shop equipment, welding equipment, woodworking machinery, metal forming equipment, shears, punches, metal stamping tools, reduction gears, variable speed controls, etc.

### Kentucky

LOUISVILLE, KY.—Cummins Distilleries Corp., Walter C. Wagner, architect, Breslin building, Louisville, will

(Please turn to Page 98)

# WHERE-TO-BUY

**A classified list of advertisers according to products. ¶Index to advertisements gives page number of any advertiser.**

**ABRASIVES (Polishing)**
Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.
**ACCUMULATORS**
Morgan Engineering Co., The, Alliance, O.
**ACETYLENE**
Air Reduction Sales Co., 60 East 42nd St., New York City.
Carbo-Oxygen Co., Benedum-Trees Bldg., Pittsburgh, Pa.
Linde Air Products Co., 30 E. 42nd St., New York City.
**ACID-PROOF LININGS**
Ceilcote, The Co., Rockefeller Bldg., Cleveland, O.
**ACIDS (Pickling)**
American Chemical Paint Co., Ambler, Pa.
**AIR COMPRESSORS—See COMPRESSORS (Air)**
**AIR CONDITIONING EQUIPMENT**
Sturtevant, B. F., Co. Hyde Park, Boston, Mass.
**AIR PREHEATERS**
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
**ALLOYS—See FERROALLOYS**
**ANGLES, CHANNELS—See BEAMS, CHANNELS, ANGLES**
**ANGLE IRON BENDERS**
Excelsior Tool & Machine Co., Ridge and Jefferson Aves., East St. Louis, Ill.
**ANNEALING BOXES**
Union Steel Casting Co. 62nd & Butler Sts., Pittsburgh, Pa.
**ANODES (All Types)**
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.
**AXLES**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
**BABBITT METAL**
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
**BANDS—See HOOPS AND BANDS**
**BANDS (Iron and Steel)**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
**BAR BENDERS**
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
**BARGES (Steel)**
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.

**BARRELS (Plating)**
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.
**BARS (Alloy)**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Steel & Tube Co., Canton, O.
**BARS (Concrete Reinforcing)**
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle, St., Chicago, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.
**BARS (Iron)—See IRON (Bar)**
**BARS (Steel)**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.
**BEAMS, CHANNELS, ANGLES, ETC.**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.
**BEARINGS (Ball)**
Bantam Ball Bearing Co., The South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
New Departure Mfg. Co., Bristol, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

**BEARINGS (Bronze)**
Shenango-Penn Mold Co., Dover, O.

**BEARINGS (Journal)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt, Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

**BEARINGS (Roller)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

**BEARINGS (Roll Neck)**
Bantam Ball Bearing Co., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Ryerson, Jos. T. & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

**BEARINGS (Thrust)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

**BENDING AND STRAIGHTENING MACHINES**
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

**BENZOL AND TOLUOL RECOVERY PLANTS**
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh.
Youngstown Sheet & Tube Co., Youngstown, O.

**BILLET CHIPPERS—SEE CHIPPERS (Billet)**

**BILLETS (Alloy and Carbon Steel)**
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

**BILLETS (Forging)**
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works, Co., Burnham, Pa.
Timken Steel & Tube Co., Canton, O.

**BILLETS AND BLOOMS**
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

**BLAST FURNACE SPECIALTIES**
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.

**BLAST FURNACES—See FURNACES (Blast)**

**BLOWERS**
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., Phillipsburg, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.
Sturtevant, B. F., & Co., Hyde Park, Boston, Mass.

**BOILER HEADS**
Bethlehem Steel Co., Bethlehem, Pa.

**BOILER TUBES—See TUBES (Boiler)**

**BOILERS**
Murray Iron Works Co., Burlington, Iowa.

**BOLT AND NUT MACHINERY**
Landis Machine Co., Waynesboro, Pa.

**BOLT CLIPPERS**
H. K. Porter, Inc., Everett, Mass.

**BOLTS**
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Co., Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.

(*Concluded from Page 96*)

soon let contract for conveyors, mills, tanks, fermenters, general machinery, etc., for plant under construction. Bids have been received on boilers and stokers. H. G. Wittenberg is general contractor, 3133 South Third street. (Noted Oct. 1.)

### Maryland

BALTIMORE—Metal Package Corp., 811 South Wolfe street, Baltimore, and 110 East Forty-second street, New York, plans plant additions and expansions, to cost $50,000.

BALTIMORE—Youngs Chemical Laboratories, care Miller-Murray & Co., 444 Madison avenue, New York, plans alterations to its plant, distribution system and equipment, at Baltimore. Project will probably mature in February. Estimated cost with equipment $28,000.

BALTIMORE—Dietrich Bros. Inc., 220 East Pleasant street, has been formed by Andrew J. Dietrich and Horace W. Dietrich, to engage in general iron and steel work.

### Tennessee

CHATTANOOGA, TENN.—Somerville Iron Works, Somerville, N. J., has received loan of $400,000 from RFC, which it will utilize to resume full production at its Chattanooga branch.

MEMPHIS, TENN.—Chickasaw Wood Products Co., R. A. Likely, plans installing new equipment to replace that recently damaged by an explosion.

### Missouri

BLAND, MO.—City, D. S. Bransom, mayor, will soon call for bids for installing complete waterworks and distributing system to cost about $44,500. Work includes 50,000-gallon tank and tower, 1-story and tower brick pump house, tees, elbows, reducers, etc. (Noted Oct. 8.)

LA PLATA, MO.—Bids will be called soon for construction of a municipal electric light and power plant, with diesel engine-generator units and distributing system, for which a fund of $100,000 is available. E. T. Archer & Co., New England building, Kansas City, Mo., are consulting engineers.

ST. LOUIS—American Metal Products Corp. has been incorporated with $10,000 capital by Jack Adler and Meyer Blocher, Title Guarantee building.

ST. LOUIS—Royal Breweries Inc., 1030 Victor street, has been incorporated with $10,000 capital by William T. Gamanche and Robert Urberger.

ST. LOUIS—Baden Furnace & Sheet Metal Co., 917 Baden street, has been incorporated by M. G. Nevins and Karl Schmidt, Diamond drive and Gibson road, to operate a foundry and machine plant.

### Oklahoma

OKLAHOMA CITY, OKLA. — Mid-Continent Pipe & Supply Co. Inc., has been organized by Joseph Brown, 517 North Fonshill street.

OKLAHOMA CITY, OKLA.—Choctaw Oil Refining Co. has been incorporated to take over and operate an idle refining plant, by Walter Williams, 2301 Northwest Thirteenth street.

TULSA, OKLA.—Birmingham Machine Co. has been organized to operate a machine shop at 40 North Birmingham street, by H. H. and P. P. Gustin, owners.

### Texas

FORT WORTH, TEX. — Rosenthal Packing Co. is considering rebuilding its packing plant at Twentieth and Grove streets, North Fort Worth, Tex.

GILMER, TEX.—Gilmer Oil & Refining Co. has been organized with $25,000 capital, to build and operate an oil refinery here, by B. L. Lee.

LONGVIEW, TEX.—Ozozo Refining Co. has been organized by J. I. Staley and J. C. Wynne, Staley building, Wichita Falls, Tex., to take over and operate former East Texas Refining Co. plant here. New cracking equipment will be installed.

PECOS, TEX.—Town, B. A. Toliver, mayor, plans $300,000 waterworks improvements, including three 300-gallon per minute deep well turbines, 20-horsepower motors; two 500-gallon per minute horizontal centrifugal boosters; 40-horsepower motors; 10,000-gallon gathering tank; 200,000-gallon storage reservoir. B. G. Warner, project engineer, Pecos, Tex.

SANTA ROSA, TEX.—Town, H. E. Bennett, engineer, 1025 South Ohio avenue, Mercedes, Tex., plans waterworks system, including 50,000-gallon tank on 100-foot tower, deep well with turbine pump and motor, 150-gallon per minute pump and 250-gallon per minute pumps with automatic control from elevated tank, etc.

### Wisconsin

MILWAUKEE — Adjustable Fixture Co., W. L. Schumaker, president, manufacturer of lamps, industrial and picture lighting fixtures, reports that its working force has been increased as a result of a gain in business of 30 per cent over a year ago.

MILWAUKEE—Taylor Mfg. Corp., 2330 West Clybourn street, manufacturer of balancing machines and dynamometers, has received so many orders from all over the country as well as from English firms, that it has been necessary to sublet considerable of its work to other Milwaukee machine shops. The firm recently added an automatic dynamometer to its line, which automatically indicates speed and horsepower at all speeds of motors being tested.

OSHKOSH, WIS.—Lakeside Distilling Co. has been incorporated with capital stock of 750 shares of no par value, to establish a distillery and manufacture alcoholic beverages, by F. J. Stieber, M. M. Stieber and E. J. Haeberle.

WAUSAU, WIS.—Wausau Brewing Co., James R. Fernock, secretary-treasurer, will soon award contracts for construction of an addition to its brewing plant, 32 x 61 feet. Oppenhamer & Obel, Wausau, architects.

### Minnesota

MINNEAPOLIS — Minneapolis Air Conditioning Co. has been incorporated to manufacture air conditioning equipment, by W. H. Seymour, Frank J. Jordan and Charles C. Reif.

SHAKOPEE, MINN. — Northwestern Distilleries Inc. has filed articles of incorporation with capital stock of $200,000 to establish a distillery in the former Nyssen brewery plant. The incorporators are D. B. Davis, W. C. Bean, C. T. Weiland, E. V. Mertz and F. L. Marloe. (Noted July 30.)

ST. PAUL—Mutual Paint Mfg. Co. has been incorporated with capital stock of $50,000 to manufacture paints, by Hiller Hoffman, N. P. Malvern and Hiller Hoffman Jr.

ST. PAUL—The West Publishing Co., S. M. Pinkerton, secretary, has awarded contracts for construction of 9-story addition to its printing plant, 59 x 81 feet, to cost $100,000.

TWO HARBORS, MINN.—City, Rudolph Erickson electrical engineer, plans construction of a new power transmission line about 35 miles in length for electric light and power service to the city.

### North Dakota

DEVILS LAKE, N. DAK.—City plans for a municipal electric light and power plant for early construction at cost of about $300,000, with equipment. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is engineer.

GRAND FORKS, N. DAK.—University of North Dakota plans construction of a lignite research plant, providing PWA allocates $200,000 to the bureau of mines for establishment of plant.

### Iowa

WAVERLY, IOWA—City has selected Howard R. Green Co., engineer, Cedar Rapids, Iowa, to prepare plans for sewage disposal plant to cost $90,000, including pump station, collector sewers and treatment plant. R. C. Clark is city clerk.

### Pacific Coast

ARCATA, CALIF.—A bond issue for $90,000 has been approved for purchase of the local privately-owned waterworks system at $75,000 and for improvements.

CLARKSBURG, CALIF. — Amalgamated Sugar Co., Ogden, Wash., plans installation of power substation equipment, motors, conveyors, loaders and other materials handling equipment in its proposed new beet sugar mill in a 75-acre site near Clarksburg. Plant will include 15 buildings, including a powerhouse. Cost will be over $1,000,000. A. J. Forbes is chief engineer. (Noted Oct. 22.)

PALO ALTO, CALIF.—City is having plans prepared for a butane gas plant, auxiliary to municipal gas plant, to include two fuel containers, compressors, heat exchangers and regulators, and small building to house plant. Estimated cost $20,000. L. H. Anderson is director of utilities.

SEATTLE—United States Mfg. Co. has been incorporated with $10,500 capital by R. E. Reid and associates, 1507 Fifth avenue, to manufacture metal and wooden chemical machines and equipment.

### Dominion of Canada

PETROLIA, ONT.—Canadian Oil Co., Cloyd A. Hale, superintendent, plans construction of new topping and cracking units, vapor recovery plant, tube still with steel tower 90 feet high, and 12 ground storage tanks of 2000 to 5000 gallons capacity each. The company is interested in prices of complete equipment. Estimated cost $350,000.